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THE DEVELOPMENT AND VALIDATION OF THE ONLINE LEARNING CLIMATE SCALE: A THREE-PHASE STUDY

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THE DEVELOPMENT AND VALIDATION OF THE ONLINE LEARNING CLIMATE SCALE: A THREE-PHASE STUDY

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
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By

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ABSTRACT OF DISSERTATION

THE DEVELOPMENT AND VALIDATION OF THE ONLINE LEARNING CLIMATE SCALE: A THREE-PHASE STUDY

With the increasing popularity of and demand for online learning in higher education (Konetes, 2011) comes a need to examine students' perceptions about classroom climate in these environments. Using the Instructional Beliefs Model (IBM) as a theoretical framework, this dissertation proposes the online learning climate (OLCS) scale for doing so. Informed by both organizational and instructional communication, as well as education, the scale consists of several variables related to instructor role(s) and behaviors, student characteristics, and course-specific structural issues to explain how students perceive climate within a computer-mediated classroom. Ultimately, this three-phase study consisted of: (a) constructing the OLCS, (b) establishing factor structure, as well as concurrent and convergent validity, and (c) establishing the scale's discriminant validity, confirming its factorial structure, and testing three theoretical models.

KEYWORDS*:* Classroom climate, Instructional Communication, Online learning, Instructional Beliefs Model

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THE DEVELOPMENT AND VALIDATION OF THE ONLINE LEARNING CLIMATE SCALE: A THREE-PHASE STUDY

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This dissertation is dedicated to my daughters.
Never be afraid to chase and accomplish your dreams.

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CHAPTER ONE: STATEMENT OF THE PROBLEM AND RATIONALE

The proliferation of college courses being offered online is increasing exponentially every year. Consequently, there is a pressing need to examine instructional communication constructs as they impact learning in online contexts to ensure pedagogical integrity. One such construct that has been shown to influence learning in traditional face-to-face settings is classroom climate. This dissertation extends what is currently known about classroom climate by investigating the relationship between climate and learning in online environments. This first chapter describes the inception of and rationale for the study. More specifically, distance education and online learning are defined and the status of best practices for designing and delivering online courses explained. Then an overview of instructional communication research regarding online learning is outlined followed by a similar summary focused on classroom climate. Ultimately, the rationale for exploring relationships between classroom climate and learning in online environments is posited.

Inception of the Study

The first online class I completed in college was a graduate course in education delivered in a synchronous format. In a synchronous delivery format, students are required to meet regularly at a specific time and date each week; however, the meeting "location" is online. For the course I took, we met in a "virtual classroom" using Adobe Connect web conferencing software. We interacted with one another in this virtual classroom much like we would have done if we had been sitting in a face-to-face classroom space. Taking this course excited me because I believed all online courses

were moving in this direction. I have since learned, however, that I was wrong.

I enrolled in another online course the next semester. The two courses were completely different. Although the new course was also synchronous, the instructor approached the use of technology quite differently. Instead of using the web-conferencing software to engage and interact with one another, the instructor read off the PowerPoint slides during our "live" meeting times. Prior to each session, the instructor would remind students not to turn on their cameras, and requested that the interactions in the chat box pertain only to questions about the lecture. My connection to the course, students, and instructor were almost non-existent. Before long I began to dread the course. For the first time in my graduate career, I felt totally disengaged. These experiences of disengagement caused me not only to dislike the time I was required to "attend" class, but also even the course content.

As a result of my experience in these two courses, I started to wonder how the interactions (or lack of them) created climate, and whether that impacted my learning in the course. I questioned whether I was defining online learning differently than others. I wondered if my experience was associated with my feelings about the course and instructor. I really wanted to know how classroom climate in these two different courses was predictive of my learning outcomes for each course. I was compelled to investigate answers to these questions and, thus, the topic for this dissertation was born.

Distance Education and Online Learning Defined

Education at a distance, online learning, and open education may all be derived from one "umbrella" term: distance education (Keegan, 1996). Keegan explains that distance education usually occurs on the student's time, which provides the student with

more flexibility to work on his or her course work. The beauty of distance education, according to Keegan, is that students can choose when, where, and how they want to learn. Distance education is unique from traditional education because the learning is facilitated through a mediated channel; the interaction between students and instructor occur at a physical and sometimes geographical distance (Valentine, 2002). While Valentine agrees with Keegan's notion of 'physical distance,' he refutes the claim that time is no longer an issue explaining that some students may still be responsible for attending classes when those classes are conducted synchronously online.

Interestingly, new and emerging technology affordances such as web conferencing software (e.g., Adobe Connect, Skype, iChat) make it easier to conduct synchronous courses online thus changing once again the way distance education is defined and viewed. The advancement of mediated tools such as the Internet and web conferencing software have helped bring students and instructors closer together.

Online learning as defined by Allen, Mabry, Mattrey, Bourhis, Titsworth, and Burrell (2004) is a format more suited for students learning outside the traditional classroom. The online environment is a place where students can focus on their individual learning progression toward understanding content rather than being forced to learn at one pace as an entire class. While Allen and colleagues note this positive potential for online learning, Easton (2003) cautions against certain formats of online learning. She explains that asynchronous formats (i.e., when students do not meet live or in real-time with other students and/or the instructor) promote an "absence of visual cues with which to send and receive messages, make quick assessments, or take corrective action" (p. 89). She continues that learning does happen even with the absence of some

of the visual cues, but instructors need to account for possible miscommunication that may occur as a result.

Online learning provides students opportunities for education from a distance (Ko & Rossen, 2010) and, as noted by Manstead, Lea, and Goh (2011) and Walther (2011), online interactions can also foster socializing amongst peers.

Current State of Online Learning

Online learning is growing in popularity for a variety of reasons. Some of them include the financial, economical, and geographical advantages it provides students, instructors, and academic institutions (Konetes, 2011). In 2011, there were a reported 6.7 million students enrolled in at least one online course (Blair, 2013). This number continues to grow as higher education institutions provide more and more programs and courses online. Across the nation, universities and colleges are making the transition from offering only courses delivered in face-to-face classroom settings to also offer some via the mediated, online world. Not only are universities and colleges encouraging faculty to design and implement online courses for certain low-level, high-demand courses, but the government has stepped in, as well (Gardner & Young, 2013). With the recent "spot-bills" like Senate Bill 520, for instance, universities in California are being encouraged to accept massive open online course (MOOC) credits to serve students' needs (Gardner & Young, 2013). This approach to online education may be problematic. Encouraging universities to take a MOOC approach could be detrimental to the education experience (Gardner & Young, 2013). These new approaches to online education need to be explored. Examining the positives and negatives of online learning may be a start toward understanding the current situation and using that knowledge to ensure pedagogical

quality in such virtual environments.

While a good deal of the attention online learning receives is positive (due to the aforementioned affordances), online learning programs and higher education institutions also garner some negative attention. Higher education institutions have been called to defend the rigor of programs and courses offered online, to explain the achieved learning impacts on students (i.e., are students really learning what they need to; what types of assessments are used), and to justify the perceived lack of socialization between peers and instructors (students do not engage with other students; missing college "experience") (Allen, 2006).

Due to these types of negative concerns, Barnard, Paton, and Rose (2007) call for more research examining the "quality of online course communication and collaboration, as perceived by students and instructors" (p. 1). They continue by explaining that online learning research is an important area of study that can be used to "improve the delivery of online courses" for those who teach and take them (p. 1). Online instructors and course designers need to know how to properly construct and deliver online courses in order to maintain integrity and quality. Instructional communication research (ICR) may help answer these kinds of questions.

In essence, since more higher education institutions are turning to mediated classroom delivery formats, examining how communication is employed effectively in online courses is warranted (Berge & Collins, 1995). Because many schools now provide initiatives such as start-up funding and paid training to design and deliver online courses, developing a tool kit of pedagogical best practices from which to draw is also crucial. Further exploration of the role of communication in online course development and

implementation is warranted.

Quality Matters and Online Learning: Best Practices

The Quality Matters Program (QMP) (2013) explains that when it comes to distance learning and blended courses, how the course is designed and implemented matters. This is one set of standards available for course builders, instructors, and administrators to rely on when assessing the quality and rigor of an online course. The Quality Matters Rubric used to assess higher education online courses is comprised of eight general standards with fifteen benchmarks. According to the QMP, the critical course components include: (1) course overview and introduction (e.g., explaining what the course entails including timelines and due dates), (2) learning objectives (e.g., competencies or knowledge the student should attain from the course), (3) assessment and measurement (e.g., the tools for how the instructor will ensure the learning objectives are met by the students), (4) instructional materials (e.g., videos, texts, lessons, activities, assignments, grading rubrics), (5) learner interaction and engagement (e.g., how the instructor plans to get students to interact with classmates and engage in content), (6) course technology (e.g., the technology provided to the student through the course, which could include platforms, learning management tools, software students will be required to use), (7) learner support (e.g., access to instructional technologist and virtual resources), and (8) accessibility (e.g., considering the different constraints like technology compatibilities and availability that a student may encounter during the online course and preparing to provide alternatives).

Specific benchmarks are to be met within each of these eight general standards. For example, course overview and introduction, which is described as creating an

"overall design of that course that is made clear to the student at the beginning of the course," proposes two benchmarks. These are: "(1.1) Instructions indicating how to start the course are clear and the navigation of online components is logical" and "(1.2) Students are introduced to the purpose and structure of the course" (QMP, 2011-2013, p. 1).

Learning objectives need to be "measurable and are clearly stated" (QMP, 2011-2013, p. 1). Two benchmarks are proposed for this standard: "(2.1) The course learning objectives describe outcomes that are measurable, are written from the students' perspective, and are appropriately designed for the level of the course" and "(2.2) The module/unit learning objectives describe outcomes that are measurable and consistent with the course-level objectives" (p. 1).

Assessment and measurement are the "strategies designed to evaluate student progress by reference to stated learning objectives; to measure the effectiveness of student learning; and to be integral to the learning process" (QMP, 2011-2013, p. 1). Three benchmarks are proposed for this standard: "(3.1) The types of assessments selected measure the stated learning objectives and are consistent with course activities and resources, (3.2) The course grading policy is stated clearly," and "(3.3) Specific and descriptive criteria are provided for the evaluation of students' work and participation and are tied to the course grading policy" (p. 1).

Instructional materials are described as "sufficiently comprehensive to achieve stated course objectives and learning outcomes" (QMP, 2011-2013, p. 1). There is one benchmark for this standard: "(4.1) The instructional materials contribute to the achievement of the stated course and module/unit learning objectives" (p. 1).

Learner interaction and engagement is described as “forms of interaction incorporated in the course that motivate students and promote learning” (QMP, 2011-2013, p. 1). The QMP outlines three specific benchmarks for this standard: “(5.1) The learning activities promote the achievement of the stated learning objectives, (5.2) Learning activities provide opportunities for interaction that support active learning,” and “(5.3) The instructor’s plan for classroom response time and feedback on the assignments is clearly stated” (p. 1).

Course technology needs to “support student engagement and ensures access to course components” (QMP, 2011-2013, p. 1). Two benchmarks are proposed for this standard: “(6.1) The tools and media support the course learning objectives” and “(6.2) Course tools and media support student engagement and guide the student to become an active learner” (p. 1).

Learner support requires that “the course facilitates student access to institutional support services essential to student success” (QMP, 2011-2013, p. 1). There is one benchmark for this standard: “(7.1) The course instructions articulate or link to a clear description of the technical support offered and how to access it” (p. 1).

Lastly, accessibility concerns the “accessibility for all students” and has one benchmark: “(8.1) Course instructions articulate or link to the Institution’s accessibility policies and services, employs accessible technologies, and provides guidance on how to obtain accommodation” (QMP, 2011-2013, p. 1).

In sum, the QMP standards and benchmarks provide a set of best practices for constructing and facilitating solid online courses. However, they do not provide details specifically focused on the role of communication in instruction in online classrooms or,

even more specifically, the function of classroom climate as it may influence learning outcome achievement. These instructional communication constructs warrant examination as they may inform and extend the best practices provided in the QMP.

Instructional Communication Research

Sprague (1992) describes instructional communication (IC) as "the investigation of the roles of communication in the teaching of all subjects at all levels" (p. 1). Mottet, Frymier, and Beebe (2006) concur with Sprague, and expand her definition of instructional communication by referring to it as a tripartite field of research. That is, instructional communication researchers focus on and examine the interaction among education, pedagogy, and communication variables. Moreover, instructional communication research explores the many sides of the learner (i.e., how students learn affectively, behaviorally, or cognitively), the instructor (i.e., the behaviors employed for effective communication and instruction), and the content (i.e., concepts, skills, and competencies). In other words, as Myers (2010) explains, instructional communication is comprised of "the meanings exchanged in the nonverbal, verbal, and mediated messages between and amongst instructors and students" (p. 149).

Sprague (1992) and others further contend that instructional communication can encompass a wide variety of contexts including online learning (e.g., McCroskey & McCroskey, 2006; Myers, 2010; Nussbaum & Friedrich, 2005). In fact, instructional communication focuses on "the role of communication in all teaching and training contexts" (McCroskey & McCroskey, 2006, p. 35). As the demand for online learning increases, so does the need for understanding how communication (in all varieties) enhances or hinders learning and the environment for learning (e.g., Konetes, 2011; Lane

& Shelton, 2001; Myers, 2010). Investigating the role of communication in online course instruction will ultimately inform instructors and scholars about how to improve course design and processes while expanding research and developing theory within this subdiscipline.

Some of the instructional communication constructs that have been studied extensively in traditional face-to-face classrooms include, for example, communicator style (Norton, 1977), instructor humor (Bryant, Comisky, & Zillmann, 1979), instructor communication concerns (Staton-Spicer & Marty-White, 1981), student communication apprehension (McCroskey, 1977), immediacy (Anderson, 1979; Gorham, 1988; Mehrabian, 1971), and instructor power (McCroskey & Richmond, 1983; Richmond & McCroskey, 1984). While these studies provide initial groundwork regarding instructional communication best practices, each of these constructs ought to be explored as they occur not only in face-to-face but also online settings.

Instructional communication research can play a key role in the development and delivery of online courses. As Barnard, Paton, and Rose (2007) so eloquently explain, communication that occurs in an online course does influence the teaching and learning process for both the instructor and students. Building on previous research by exploring how communication impacts student learning in online settings may benefit all those involved. One instructional communication construct that has been highly correlated to effective teaching and learning in traditional face-to-face settings is classroom climate.

Instructional Communication Climate Research

Classroom climate may be described as the perceived sense of connectedness among teacher and students. A considerable amount of research exists in the field of

instructional communication focused on classroom climate and learning outcome achievement. Some research examines, for example, student perceptions of classroom climate (Cooper, 1995) and instructor use of affinity-seeking strategies to build climate (Myers, 1995). Other research focuses on student-instructor and student-student relationships as related to climate (Dwyer et al., 2004). And still other research examines the relationship between climate and student motivation (Mazer, Murphy, & Simonds, 2007; Myers & Rocca, 2001), as well as the relationship between classroom climate and learning outcome achievement (Kerssen-Griep, Trees, & Hess, 2008). More specifically, Cooper (1995) explains that a positive classroom climate benefits students because they feel connected to the instructor and course content. Dwyer et al. (2004) further posit that a positive climate influences a positive perception of the course and instructor. While instructional communication scholars have produced a comprehensive line of research that examines classroom climate in traditional face-to-face settings, much less is known about what constitutes climate in online settings from a communication perspective.

Thus, extending classroom climate research to examine the online learning environment from an instructional communication perspective seems to be an area worth exploration. Hence, the purpose of this three-phase study was to construct and validate an online learning climate scale (OLCS), thereby extending both the current classroom climate research and online learning literature.

In essence, exploring communication climate in the online learning classroom may extend instructional communication research in this area beyond the four walls of a traditional classroom. Conclusions may inform verbal and nonverbal best practices for instructors and instructor training programs beyond the typical face-to-face interaction

currently investigated. Examining instructional communication in online learning environments may not only advance the discipline, but also address the need to focus on relevant problems and issues that affect higher education, instructors, and students.

Classroom Climate in Online Learning Environments

Online learning courses occur within a computer-mediated context. In other words, instructors and students use computers and computer technology to communicate in order to teach and learn.

Some educators have raised concerns about a lack of sufficient interaction and engagement in online learning environments (Allen, 2006). Moreover, such interaction and engagement among the instructor, students, and course content are key constructs for creating climate. For these reasons, Allen (2006) cautions educators to "be aware of the consequences of "distancing" our students from on-campus experiences (p. 125). Many of these concerns raised by Allen and others are based on asynchronous course delivery, which afford students an opportunity to complete coursework at their own pace and according to their own schedule. Asynchronous course design does not employ face-to-face interaction in any live or virtual context. Easton (2003) cautions that the asynchronous format hinders communication because there is an "absence of visual cues with which to send and receive messages, make quick assessments, or take corrective action" (p. 89). She explains that learning may still occur even with the absence of some of the visual cues, but instructors need to account for any miscommunication that may occur. Walther (2011) agrees, but contends that web conferencing also ought to be used to deliver some or all portions of the course synchronously. Doing so will afford instructors a means by which to achieve the interaction-learning objective.

Advances in technology have made it much easier to deliver synchronous courses or portions of courses. Doing so may afford students an opportunity to interact and engage virtually via what communication scholars label social presence (Manstead, Lea, & Goh, 2011). Essentially, social presence online embodies "the physical and the social dimensions" via a mediated channel (Manstead, Lea, & Goh, p. 147). Today, instructors can use web conferencing software and programs to promote not only visual cues but also the presence of others within the setting. "Simply put, talking to, listening to, and looking at someone provides a simple and efficient interface for the transmission and reception of information and for the management of turn taking" (Walther, 2011, p. 27).

Since interaction and engagement are key constructs for creating climate and computer technology now makes it possible to do so virtually via social presence, it seems prudent to expand instructional communication toward developing a clearer understanding of what constitutes online classroom climate (a.k.a. cyber climate) and how it is achieved (Fraser, 2002). As Bujdosó (2008) concludes:

> Understanding how to establish and maintain a positive cyber climate is considered as the basic part of improving efficiency of learning, we can show significant relationships between cyber climates and matter such us learning methods, self-efficacy, time saving, convenience, etc. *[sic]*. (p. 15)

Thus, studying the relationship between classroom climate and learning in online settings is important. Moreover, doing so from an instructional communication perspective is important not only because it will extend communication theory, but also because it will enhance understanding about how communication functions in instruction that takes place in a mediated context. Creating a valid and reliable online learning

climate scale will provide one means by which to do so.

Organization

This dissertation is organized into six chapters. Chapter one discusses the current issues and state of online learning as well as rationale for the current three-phase study. The second chapter grounds the three-phase study in relevant communication and education research, as well as proposes several research questions and hypotheses. Chapters three through five detail methods and results for each phase of the dissertation study. Finally, chapter six outlines the overall conclusions and implications and posits suggestions for future research.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

This dissertation is based on the assumption that classroom climate influences learning and that this is true in both face-to-face classrooms and online classroom environments. Moreover, classroom climate in either setting is comprised of several constructs. Thus, this review first examines conclusions of relevant literature focused on the relationship(s) between classroom climate(s) and learning in conventional face-to-face settings. In doing so, an operational definition of classroom climate is posited; a definition on which this dissertation is based. Next, this review describes several different theoretical models and instruments that have been used to examine classroom climate. Finally, the Instructional Beliefs Model (IBM) is offered as the theoretical framework for this study and explained as it was modified to examine climate in an online learning environment.

Classroom Climate and Learning

A good deal of instructional communication research has examined climate in traditional face-to-face classroom settings. Although no one definition of classroom climate has been agreed upon in the instructional communication literature (Myers, 1995), most studies do suggest that classroom climate is a "distinctive 'personality' of a setting or environment" (Moos & Trickett, 1987, p. 2). Moreover, a positive classroom climate has been positively correlated to improve learning outcome achievement in multiple studies (e.g., Dwyer, et al., 2004; Fraser, 2002; Ifert Johnson, 2009; Mazer et al., 2007; Myers, 1995). Because classroom climate in face-to-face settings has been consistently correlated with learning, it seems prudent to discover how a positive classroom climate can be achieved in online settings, as well.

Perhaps the most widely debated issue surrounding the nature and definition of classroom climate centers on who constructs and controls it. Some scholars claim that classroom climate is constructed solely by "students' perception of their learning environment" (Kerssen-Griep, Tress, & Hess, 2008, p. 316). Others contend that instructors play an important role in establishing and controlling climate (e.g., Cooper, 1995; Myers, 1995; Stuart & Rosenfeld, 1994). Cooper and Simonds (2007) explain, for example, that "a supportive classroom climate fosters fuller development of a student's positive self-image and enhances self-concept" (p. 13). Moreover, they contend that "the teacher sets the classroom climate" (p. 13). Still others claim that instructors and students co-construct climate. Trickett and Moos (1973), for example, argue that climate is achieved "not only [via] teacher behaviour and teacher-student interaction but student-student interaction as well" (p. 94). Alternatively, Myers and Rocca (2001) suggest that instructor and students determine climate differently. They contend that instructors determine climate based on "the need to disseminate information, mange student behaviors, or influence students' outcomes. For students, climate may be determined by the need to gain social approval, recognition, or confirmation" (p. 118).

Although opinions differ regarding whether students, or instructors, or both instructors and students determine classroom climate, there is agreement about the closely related constructs that comprise it. These include, for example, perceived sense of connection and belongingness (e.g., Dwyer et al., 2004; Lee & Robbins, 1995; Schaps, Lewis, & Watson, 1997), intentionality of instructor and student behaviors (e.g., Kerssen-Griep, Trees, & Hess, 2008; Mazer et al., 2007; Myers, 1995; Myers & Rocca, 2001), classroom interaction among instructor and students (e.g., Dwyer et al., 2004), and

structure (e.g., James & Jones, 1974). This section describes these constructs as they work together to form an operational definition of classroom climate for this dissertation.

Arguably the most prevalent construct set forth in the literature is the perception of a relational connection among students and instructor. Schaps, Lewis, and Watson (1997) explain that "students' sense of connection to, being valued by, and having influence with their classmates and instructor" *[sic]* determines the overall classroom climate (p. 14). This sense of being connected to a class, in turn, fosters "student motivation to communicate" (Martin, Myers, & Mottet, 1999, p. 156).

This sense of connection and belongingness emerges from the degree to which instructor and student interaction is perceived as supportive or defensive. As Dwyer et al (2004) contend, "student perceptions of a supportive and cooperative communication environment" influence classroom climate (p. 2). These perceptions then create a positive or negative attitude about the class and overall learning experience (Gibb, 1961). A positive classroom climate is predicated on "how well instructors establish an environment in which mutual interaction is valued, encouraged, or supported" *[sic]* (Myers, 1995, p. 193).

Classroom climate can be positive or negative and a good deal of research maintains that a positive classroom climate is achieved when instructor and students intentionally engage in certain behaviors. To clarify, students and instructors make intentional communication choices about using humor, revealing personal information, and seeking affinity. These choices ultimately work together to create the classroom climate (e.g., Mazer et al., 2007; Myers, 1995; Stuart & Rosenfeld, 1994).

Stuart and Rosenfeld (1994) explain that instructors can create climate through

humor. Appropriate humor may foster trust, encourage students to ask questions, and increase content comprehension. The authors caution instructors to:

> "minimize their use of hostile humor, and maximize their use of nonhostile humor. Such actions may quite possibly allow them to increase the perceived supportiveness and reduce the perceived defensiveness of their classroom climate, and, at least, will do no harm" (p. 94).

Regarding disclosure of personal information and rapport, Mazer and colleagues (2007) caution that:

> "self-disclosure is one approach that teachers may take to develop relationships with their students. However, as communication technology develops at an increasing rate, it is important for teachers to recognize how certain technologies, even those used largely by students, can positively affect student-teacher relationships" (pp.14-15).

They further explain "self-disclosure is one approach that teachers may take to develop relationships with their students" (p.14).

According to Myers (1995), "the use of affinity-seeking strategies has been explored from both the perspectives of the teacher and the student" (p. 192). Those strategies are positively associated to the students' perceptions of classroom climate. Myers notes there are 25 affinity-seeking strategies, and of those 25, a total of 19 strategies may be correlated to classroom climate. These strategies include: "altruism, assume control, assume equality, comfortable self, conversational rule-keeping, dynamism, elicit other's disclosure, facilitate enjoyment, influence perceptions of closeness, listening, nonverbal immediacy, optimism, personal autonomy, present

interesting self, self-concept confirmation, sensitivity, similarity, supportiveness, and trustworthiness" (p. 195). He further explains the importance of instructors being aware of the 19 affinity-seeking strategies when constructing a positive classroom climate.

Several studies suggest that the nature of the interaction among instructor(s) and students plays a major role in determining classroom climate. Cooper (1995) suggests that these classroom interactions are based on five principles:

> 1) Individuals in the classroom are either the instructor (one who holds the power) or the student (one who answers the power).
>
> 2) The classroom presents a forum for informational messages rather than persuasive.
>
> 3) The focus of the message is to build competencies.
>
> 4) Students are learning to socialize.
>
> 5) The evaluation process is reciprocal and ongoing throughout the school year. (p. 200-202)

Trickett and Moos (1973) claim not only that instructor and students work together to create the climate through "shared perceptions in the environment" *[sic]* (p. 94), but also suggest that classroom climate is distinctly unique to the specific situation. They continue stating, "the classroom is a critical locus for student interpersonal and educational development, and the notion that classrooms have distinct atmospheres or climates that mediate this development has been in the working vocabulary of educators and researchers for years" (p. 94).

Another theme adapted from organizational communication climate research focuses on course structure as it influences classroom climate. James and Jones (1974)

suggest that, in the end, climate is correlated with several contributing factors: individual autonomy, structure, reward orientation, consideration, warmth, and support. They encourage future climate work make a distinction between the organization (or context) attributes and an individual's attributes stating climate is a "perceptual measure that describe[s] the organization and [is] different from attitudinal evaluative, and need satisfaction variables" (p. 1110). Therefore, future climate work should take into consideration the suggestions of James and Jones that climate is more than just instructor created or student-student created, but also a function of course structure.

Although face-to-face and online classrooms are arguably two different environments, both serve the same purpose: to share messages in ways that result in learning. Moreover, a positive classroom climate may help achieve this goal. Based on the existing research on classroom climate and the constructs comprising it, the operational definition grounding this study is *a perceived connection among peers, instructor, and course based on the verbal and nonverbal messages exchanged between and among students and instructor*. With this definition in mind, a measurement scale to operationalize online learning climate must incorporate elements of the instructor, students, and the course structure.

Theoretical Models for Measuring Classroom Climate

Several different instruments have been used for measuring classroom climate in the traditional face-to-face classroom setting. These instruments were derived from scholarship in the fields of education and psychology, as well as instructional communication. Each instrument was designed to examine some variable related to classroom climate (e.g., student perceptions of connectedness, affinity, immediacy, and

affect for instructor and/or course). However, this line of research also points to the fact that "the perception of classroom climate is undoubtedly influenced by other variables as well" and calls for future research to "strive to identify and define the components which comprise classroom climate" (Myers, 1995, p. 198). It follows that reviewing such scales and the conceptual and operational definitions upon which they are based should provide insight into the aspects of classroom climate currently being captured. Hence, the following climate scales will be reviewed: Learning Environments Inventory, Classroom Environment Scale, Classroom Climate Questionnaire, the College and University Classroom Environment Inventory, Classroom Climate Scale, Social Connectedness Scale and the Classroom Connectedness Climate Inventory.

The Learning Environments Inventory (LEI) was developed in the late 1960's. This instrument sought to measure a student's perceived social and emotional classroom climate. Questions assess a student's perception on topics like: cohesiveness, diversity, apathy, and favoritism using a five-point Likert scale. Walberg and Greenberg (1997) explain "well-organized, satisfying classrooms foster responsibility, humaneness, and mutual respect—the very social skills students need to participate productively in our civil society" (p. 46). This scale developed by education researchers is valuable; however, it fails to focus intentionally on communication constructs as they influence classroom climate.

The Classroom Environment Scale (CES) was also originally developed in the late 1960's and later modified by Moos and Trickett in 1987. This scale has not been used extensively in communication but has demonstrated utility in education studies focused on traditional face-to-face classrooms and interactions.

Rosenfeld's (1979) Classroom Climate Questionnaire (CCQ) examines how communication in the classroom impacts the overall perception of climate. "The CCQ focuses specifically on the relative supportiveness and defensiveness of the classroom environment. Previous studies utilizing the CCQ support its construct and content validity, as well as its reliability (see Rosenfeld, 1983; Rosenfeld & Jarrard, 1985)" *[sic]* (Stuart & Rosenfeld, 1994, p. 90). The CCQ is an appropriate measure for examining the communication climate in a classroom, but serves to measure only whether the climate is supportive or defensive. Myers (1995) notes, "The CCQ is limited in that it only measures supportive and defensive behaviors, which may be inherent within other teacher communication behaviors (i.e., credibility, immediacy, compliance-gaining)" (p. 198). Thus, it fails to consider other communication constructs that may influence classroom climate.

Another popular climate measure used in education is the College and University Classroom Environment Inventory (CUCEI) (Fraser & Treagust, 1986). The CUCEI examines the classroom variables that influence students' perceptions of climate. Much like the communication measures aforementioned, Dwyer et al. (2004) note that the CUCEI "emphasizes instructor-to-student behaviors and only minimally addresses the sense of connectedness among students that may be fostered by student-to-student behaviors" *[sic]* (p. 266).

The Classroom Climate Scale developed by Gokcora (1989) measures classroom climate and teaching strategies in two different school contexts (i.e., international school vs. American school) using semantic differential statements. The scale has been adapted and used in communication studies to measure the use of technology as related to

classroom climate (see Mazer et al., 2007). "Gokcora's measure is a general, yet abbreviated, scale more appropriate for exploring teacher use of Facebook as an underrepresented area of communication education scholarship. Future research with this condensed scale may offer scholars a reliable and valid instrument to explore the effects of teacher behaviors on an important classroom communication construct" (Mazer et al., 2007, p. 14). Although the CCS has been used to measure a mediated communication interaction within a traditional face-to-face class, it has not been used to measure climate in an online learning context.

Lee and Robbins (1995) created the Social Connectedness scale to measure a student's connection to the other students and his or her environment. They explain, "A person struggling to feel connected begins to feel different and distant from other people. He or she may find it hard to accept social roles and responsibilities, leading the person into greater isolation. The person will try to relate with others but will get frustrated or disappointed by the failure of others to understand him or her" (p. 236). Hence, the person may not feel as though they belong in or are connected to the environment. While this scale purports to capture student perceptions of connectedness to the environment, the scale focuses on social interaction rather than learning as the outcome variable.

In 2004, Dwyer et al. created the Classroom Connectedness Climate Inventory (CCCI). They explain that not only does the instructor impact the perception of climate but so do the students. They contend that climate is constructed based on the student-student connectedness that is shared within the classroom. Later, Ifert Johnson (2009) validated the CCCI and suggested that future research "should examine connected classroom climate in conjunction with measures of instructor behavior, including

instructor-focused measures of supportive classroom climate" (p. 155). The CCCI proposes to capture another factor of climate construction. Dwyer and colleagues explain that the instructor is not the sole creator of climate. Rather, climate creation is a shared responsibility among the students in the course, as well. While this shared responsibility of students makes sense in face-to-face courses where students see each other and interact regularly, it may be less important in online courses where students rarely if ever have an opportunity to "see" or "meet" one another.

While each of these instruments capture various elements of classroom climate, they were designed for examining climate as it occurs in traditional face-to-face classrooms. In other words, none have been used to determine classroom climate in online settings. If face-to-face and online classrooms are two distinct learning spaces, measuring online climate using scales designed for face-to-face settings could yield inadequate and/or misleading interpretations and conclusions. Instead, it seems more appropriate to select and adapt certain elements in each of them to construct a scale uniquely suited to measure climate in online classroom contexts.

Theoretical Framework: Instructional Beliefs Model (IBM)

This section describes and justifies the choice to ground the present dissertation study in the Instructional Beliefs Model (IBM) created by Weber, Martin, and Myers in 2011. Instructional researchers need to provide a theoretical framework for their research, since minimally, it would add context to their findings. However, the larger issue that necessitates the development of theories that are unique to the field of instructional communication is the legitimization of the field (Weber, Martin, & Myers, 2011, p. 52).

One way to combat this concern and theoretically frame or understand how

students achieve learning outcomes within instructional context is the Instructional Beliefs Model. A student's "academic self-efficacy" or "belief in the ability to succeed in a given course, or interest in a course" *[sic]* (Weber, Martin, & Myers, 2011, p. 52) fosters his or her instructional perceptions about the class and content (LaBelle, Martin, & Weber, 2013). According to Weber et al. (2011), these beliefs are influenced by three first order variables (i.e., instructor behaviors, student characteristics and behaviors, and course-specific structural issues), which in turn may influence the student's learning outcomes achievement. Since the student's instructional beliefs about a course mediate the significant relationship between the first order variables and learning outcomes, Weber and colleagues conclude that "a significant relationship exists among all the first-order variables" (p. 53).

The IBM helps frame this study by serving as "an authentic theory of instructional research that views communication as central to the instructional setting" (Weber, et al., 2011, p. 53). More specifically, it grounds this dissertation by focusing on "*how* and *why* these constructs are related" rather than "whether or not certain instructional variables are related to each other" (p. 53). In other words, this study explores how these first-order constructs (i.e., instructor behaviors, student characteristics, and course-specific structural issues) work together (for or against each other) to establish the perceived classroom climate. Whether these first-order constructs are influenced by climate or vise-versa is unknown. Exploring the relationship between the two may further refine the model by extending its utility to explain how climate functions in online classrooms.

While the IBM theoretical framework itself is fairly new, an extensive body of research does exist that supports the link between instructor behaviors and student

perception of learning (e.g., Andersen, 1979; McCroskey, Valencic, & Richmond, 2004; Weber et al., 2011). Below is a description of the three first-order constructs that comprise the instructional beliefs model. These first-order constructs are instructor behaviors, student characteristics and behaviors, and course-specific structural issues.

Instructor behaviors.

Weber and colleagues (2011) describe instructor behaviors as "the classroom behaviors in which instructors engage to establish effective and affective communication relationships with their students" (p. 53). Using Mottet, Frymier, and Beebe's (2006) notion that instructors employ rhetorical and relational messages to achieve specific outcome goals in the classroom, Weber et al. explain and provide a list of behaviors (i.e., variables such as affinity-seeking, clarity, nonverbals, relevance) that instructors employ in the classroom, which influence not only learning outcomes but also motivation (e.g., Chesebro & McCroskey, 1998, 2001; Frymier, 1994; Frymier & Shulman, 1995; Kearney & McCroskey, 1981; Kelley & Gorham, 1988; Plax, Kearney, McCroskey, & Richmond, 1986; Richmond, 1990). In the traditional face-to-face classroom, the instructor's primary role is to provide instruction (e.g., disseminating information, facilitating discussion, grading assignments). The instructor is perceived as the one who holds the power (Cooper, 1995).

Instructor-student relationships.

In a traditional face-to-face classroom, Frymier and Houser (2000) suggest that the instructor-student relationship is an interpersonal one fostered by intentional interactions between the instructor and student. Moreover, McCroskey (1994) notes that student reports of positive instructor-student interactions lead to a positive affect for the

class. Frymier and Houser (2000) claim that when students feel connected to the instructor and class, they report learning more. Martin, Myers, and Mottet (1999) extend this claim by arguing that such a perceived connection leads to more motivation to communicate in the classroom. This sense of connection may be achieved via immediacy and disclosure.

Immediacy behaviors.

Immediacy behaviors are the strategies instructors employ to reduce the perceived distance between the student and instructor (Arbaugh, 2001). These behaviors positively impact students' perceptions of affect for course and instructor, as well as positive perceptions of cognitive learning and motivation (Arbaugh, 2001; Christophel, 1990; Gorham, 1988; Richmond, Gorham, & McCroskey, 1987). In a traditional face-to-face classroom, for example, an instructor might smile, use direct eye contact, call on students by name, and move around the room while engaging students in discussion (Frymier & Houser, 2000).

The immediacy research provides strategies for instructors to use in the classroom to positively influence the student's learning (i.e., affective learning and the student's perceived relationship with the instructor) (Frymier & Houser, 2000). A wealth of information exists on communicative strategies teachers may use to gain compliance (Burroughs, Kearney & Plax, 1989), achieve learning outcomes (Clark, 2002; Frisby & Martin, 2010; Goodboy & Martin, 2008), create a positive perceived instructor-student relationship (Frymier & Houser, 2000; Sorensen, 1989), build motivation (Carrell & Menzel, 2001; Richmond, 1990), and even alter a student's behavior (Horan & Myers, 2009; McCroskey, Richmond, Plax, & Kearney, 1985). These strategies have been

deemed applicable for primary, secondary, and college level classrooms.

Disclosure.

The use of self-disclosure as a teaching tool promotes discussion, connections with the content, and perceived instructor-student relationships in the classroom (e.g., Hosek & Thompson, 2009; Kaufmann & Lane, 2014). It appears that appropriate self-disclosure in relation to course content works toward building climate. Students' perceptions of instructors who disclose appropriately are positively correlated to affective learning and the perceived instructor-student relationship (Sorenson, 1980, 1989). Using disclosure in traditional face-to-face classrooms has been linked to positive perceptions of both the instructor and the course, and may be considered an "effective instructional tool that can be used to increase student participation, interest, understanding, and motivation" (Cayanus, 2004, p. 9).

Student characteristics and behaviors.

Weber and colleagues discuss student characteristics as "those qualities that differentiate one student from another student" (p. 54). They explain that these variables range from "traits such as intelligence, trait motivation, conscientiousness, need for success, need for cognition, and state motivation" (p. 54). In addition to characteristics, student behaviors include variables such as student's willingness to talk, participation in class/group, engage with other students, and even build relationships (Dwyer et al., 2004).

Student-student interactions.

The interactions that occur among students can influence student perception of the

class and its climate. "Although instructors cannot control student behavior, they can facilitate positive student–student interaction" (Ifert Johnson, 2009, p. 154). In traditional face-to-face classrooms, this can be accomplished through appropriate disclosure among peers and may contribute to positive student-student relationships (Dwyer et al., 2004). Positive student-to-student interactions can be achieved in a number of ways, but it is the instructor's responsibility to help initiate such interactions. Student-to-student relationships can be fostered through disclosure activities (Cayanus, 2004). Essentially, when students interact with other students, they perceive a connectedness to the class (Dwyer et al., 2004). Thus, positive student-student relationship may be an indicator of perceived connectedness, which leads to a positive climate and affective learning.

Course-specific structural issues.

Weber and colleagues (2011) define course-specific structural issues as the "things contained in a course syllabus [that] . . . are unique to a given course" (p. 54). These include, for example, assignments, grading criteria, and classroom participation policies. The issues that occur in an online course may or may not resemble the issues in a traditional face-to-face classroom. Being clear, consistent, and fair with classroom policies like assignments and grading have been linked to positive perceptions of affective learning (Chory-Assad & Paulsel, 2004). Student perceptions of clarity, for example, might differ dramatically for students taking an online course than for those enrolled in a traditional face-to-face course. Whereas teachers may improve clarity via nonverbal communication cues in a face-to-face course, doing so might be difficult in an online setting.

IBM Adaptation for Online Settings

Fulfilling Weber et al. (2011) call to continue testing IBM with other variables and in different contexts, this study seeks to extend the model through validation of the proposed online learning climate scale. The first-order constructs are necessarily adapted to do so. These adaptions are explained in the following paragraphs.

Instructor behaviors.

As is the case in a traditional face-to-face classroom, the online instructor's primary role is to provide instruction (e.g., disseminating information, facilitating discussion, grading assignments). Unlike instructors in traditional face-to-face classrooms, however, online instructors are geographically separated from students and use mediated communication channels (e.g., Adobe Connect, email, learning management systems) to disseminate messages and foster engagement. Instructor behaviors may be understood as they emerge from instructor role(s) in online classrooms. Moreover, instructor roles and behaviors as they influence classroom climate may be clarified by comparing them to instructors in traditional face-to-face classrooms.

Although online instructor role(s) are similar to those of instructors in traditional face-to-face classrooms in many ways, they tend to be more labor intensive and constantly changing. For example, designing a good online course is very labor intensive. Kleinman (2005) points out how difficult it can be to clarify course expectations in ways that ensure students completely understand what they are responsible for regarding assignments, engagement, interactions with other students, and how they will be graded based on those assessments. Furthermore, instructors must:

"clearly define qualitative and quantitative requirements for online discussion

participation. Threaded discussions, whether in synchronous course chat rooms or asynchronous discussion forums, provide students with opportunities for learning from the questions and answers posted by everybody in the course. These discussions can also help build community" (p. 14).

Moreover, as new technologies become available, online instructors must adapt their instructional strategies.

Student characteristics and behaviors.

College students decide to take online courses for a variety of reasons. These reasons range from financial constraints to time management issues to family and work obligations (Konetes, 2011). Online learners identify the self-paced approach of most online courses and ability to work on course content at their convenience as major advantages (Keegan, 1996). As Serhan (2010) notes, online courses "offer students an opportunity to care for their family and home, giving them a chance to set their priorities without sacrificing an education" (p. 23). Conversely, online learners identify lack of immediate feedback, limited interaction with instructor and classmates, technical problems, and workload as main disadvantages (Serhan, 2010). Because online learners tend to be geographically separated from their peers and instructor, student variables related to interactions and social presence may impact impressions of online course climate.

Student-student interactions.

The interactions that occur among students can influence student perception of the class and its climate. In traditional face-to-face classrooms, appropriate disclosure among peers may contribute to positive student-student relationships (Dwyer et al.,

2004). The same is true in online classrooms. Student-to-student interaction builds a community of learners, which leads to a positive classroom climate. Positive student-to-student interactions can be achieved in a number of ways, but it is the instructor's responsibility to help initiate such interactions. Student-to-student connectedness can be fostered through intentional disclosure activities or interactions (Dwyer at al., 2004). Essentially, when students interact with other students, they perceive a connectedness to the class (Dwyer et al., 2004). Thus, the student-student relationship is an indicator for perceived connectedness affective learning.

Social presence.

Social presence refers to the "extent to which the situation is made social through the communication setting and the norms associated with it, the nature of the interpersonal relationship between the communicators, common group membership, shared social identities, and the unfolding communication itself" (Manstead, Lea, & Goh, 2011, p. 148). Garrison (2007) echoes this definition and further claims that social presence online helps foster purposeful and personal relationship building. Manstead et al. note two crucial considerations for presence to occur. First, individuals must be aware that others exist in the online context (i.e., in an online learning environment, students must be aware they are not the only student in class and need to engage with other students). Second, individuals need a social component (i.e., students need to engage with one another to build social context or relationships).

Course-specific structural issues.

The issues that may occur in an online course may not occur or even resemble those issues in a traditional face-to-face classroom. One of the most significant course-

specific structural issues may be associated with the navigation in of the technology platform that serves as the virtual classroom space. For Ko and Rossen (2004) the solution is simple, instructors need to "understand the need to prepare students adequately for what they are about to encounter and to provide them with the necessary tools to get through the course. These efforts will complement the work put into designing the course and syllabus" *[sic]* (p. 183).

Technology platform.

Learning management systems (LMS) serve as a technological platform for instructors to communicate with their students. Commonly referred to as LMS, the software allows instructors to create online "virtual" classrooms that host modules where students watch lessons, have discussions, post assignments, and even meet synchronously with classmates in web conferencing rooms. Popular LMS programs used in higher education are Blackboard, Canvas, and eLearning. Each of these platforms approach online learning differently (e.g., tools provided, visual design). Thus, each one establishes its own unique atmosphere.

The literature examining the online classroom published more than ten years ago is dated, but still provides insight regarding how far technology and communication research has progressed. Many of the issues with technology and online learning have been addressed or corrected (e.g., lack of socialization in online courses has been addressed with new and innovative web conferencing tools). Considering how technology is accessed, used, and the impact on perceptions of the class, the instructor, and the content would be a fruitful investigation regarding the importance (or lack thereof) of technology's role.

Thus, this three-phase study examines the utility of the Online Learning Climate Scale grounded in and modifying Weber, Martin, and Myers (2011) Instructional Belief Model for measuring classroom climate in online settings.

Research Questions and Hypotheses

This comprehensive literature review suggests that a positive classroom climate may foster student motivation, affect, and cognitive learning in traditional face-to-face classrooms. A positive classroom climate may be achieved through instructor immediacy and disclosure strategies that promote positive instructor-student relationships. Similarly, student interactions may promote student-student relationships that also influence a positive classroom climate. What is yet unknown, however, is what specific instructor behaviors, student characteristics and behaviors, and course-specific structural issues promote a positive classroom climate in online settings. Moreover, no scale exists to date for measuring them. Thus, this three-phase dissertation poses the following research questions and hypotheses by phase.

Phase One

RQ_{1a}: What impressions do students who have taken on online course have of the newly constructed online learning climate scale?

RQ_{1b}: What impressions do online course instructors and designers have of the newly constructed online learning climate scale?

Phase Two

RQ_2: What kind of reliable factor structure for perceived online learning climate (OLCS) can be achieved?

H_1: OLCS is associated positively with student reports of affective learning.

H_2: OLCS is associated positively with student reports of cognitive learning.

H_3: OLCS is associated positively with student reports of behavioral intentions.

H_4: OLCS is associated positively with classroom climate scale (CCS).

H_5: OLCS is associated positively with connected classroom climate inventory (CCCI).

Phase Three

RQ_3: Can the factorial structure of the online learning climate scale (OLCS) be replicated?

H_6: OLCS is a distinct measure from the connected classroom climate inventory (CCCI).

H_7: OLCS is a distinct measure from the classroom climate scale (CCS).

H_8: Classroom procedural justice will predict learner empowerment.

H_9: Appropriate instructor disclosure will predict learner empowerment.

H_{10}: Student willingness to talk (i.e., engage) will predict learner empowerment.

H_{11}: Learner empowerment will predict (a) affective and (b) cognitive learning.

RQ_4: Based on the proposed hypotheses [H_8- H_{11}], can the alternate model with adapted variables for online classroom context be supported?

H_{12}: Learner empowerment will predict student self-reported behavioral intentions.

H_{13}: Student self-reported behavioral intentions will predict (a) affective and (b) cognitive learning.

RQ_5: How does a student perception of climate influence the alternative model?

Summary

This chapter provided a review of literature on which the research questions and hypotheses examined in this dissertation study are based. More specifically, it offered an operational definition of classroom climate, described several instruments used to measure climate in traditional face-to-face classrooms, explained the Instructional Beliefs Model (IBM) as a theoretical framework for understanding how instructor behaviors, student characteristics and behaviors, and course-specific structural issues interact to influence classroom climate in traditional face-to-face settings, and proposed some adaptations to the IBM that make it applicable for examining classroom climate in online contexts. The next three chapters describe methods and discuss results for each part of the three-phase study.

CHAPTER THREE: PHASE ONE - OLCS DEVELOPMENT AND ITEM GENERATION

Given the lack of research focused on classroom climate in online learning environments and knowing that climate impacts learning in traditional classroom settings, a three-phase study was conducted. The first phase of this dissertation research project consisted of the development of an online learning climate scale. This chapter describes the rationale, proposed questions, methods and procedures employed to complete this phase, as well as a brief discussion of the results.

Rationale: Developing an Online Learning Climate Scale

The purpose of survey research is to collect data about a question or phenomenon within a specific population of study (Fowler, 2009). Creating a new communication scale examining online learning climate serves three purposes for instructional communication and online learning: (a) examine understudied phenomenon, (b) provide a predictive measurement, and (c) continue to build upon established research.

A scale has yet to be developed and validated within the field of instructional communication that examines classroom climate in the online setting. To date, classroom climate has been defined and examined solely within the face-to-face classroom context. Research conducted regarding traditional classroom climate shows the importance of building positive classroom climate and its impact on students' perceptions and learning outcomes (Kerssen-Griep, Trees, & Hess, 2008), student relationships they form in class with other students and the instructor (Dwyer et al., 2004), and student motivation to learn course material (Mazer et al., 2007). Developing a new online learning climate scale would confirm and extend those findings to include what occurs in an online

classroom context.

The Online Learning Climate Scale (OLCS) examines how student perceptions of climate predict instructional beliefs (or academic self-efficacy) and learning outcomes. Keeping with Clark's (2002) call for research examining other classroom contexts and learning outcomes, this scale provides information about climate and learning outcomes that may be useful for future development of online courses and instructor training programs.

Online learning is gaining in popularity due to the affordances it provides students, instructors, and academic institutions (Konetes, 2011). The creation of a valid and reliable scale for understanding how classroom climate is created in online settings will extend an important and understudied line of instructional communication research. Thus, the scale developed for this dissertation may provide a foundation for future studies informing how communication operates in online classrooms.

Measure Development

The scale development process begins with thinking about research interests and whether there is already a scale created to capture an understanding of those interests. Noar (2003) suggests to first consider the intended purpose of the scale and then possible applications for it. From there, one can propose a specific question (e.g., what does online learning climate look like to online students?) and review the related literature. DeVellis (2012) encourages researchers to look at similar scales while reviewing the literature because doing so will help conceptualize the new scale. For the purposes of this study, the following scales were reviewed: Dwyer et al.'s (2004) Classroom Communication Connectedness Inventory as validated by Ifert Johnson (2009) and Gokcora's (1996)

Classroom Climate Scale. The OLCS was then developed using a three-part process.

Part One.

Using DeVellis (2012) as a guide, an initial pool of 47 items was created. The items were modeled based on the theoretical framework of the Instructional Beliefs Model (Weber et al., 2011): (a) instructor behaviors, (b) student characteristics and behaviors, and (c) course-specific structural issues. The following paragraphs explain the step-by-step process employed to construct the scale.

The instructor behavior items depicted in Table 1 (n = 15) were derived from teacher behavior literature, as well as from Gokcora's (1989) sematic differential scale. These items reflect the "classroom behaviors in which instructors engage to establish effective and affective communication relationships with their student" (Weber et al., 2011, p. 53). Items for this category focused on student perceptions of instructor behaviors.

Weber et al. (2011) define student characteristics as a construct that "deals with those qualities that differentiate one student from another student" (p. 54). For the OLCS, student characteristics are depicted in Table 1 (n = 13). They reflect the perceptions students have of other students based on Dwyer et al.'s (2004) notion of student connectedness. Items from the connectedness climate scale were also modified and used for two reasons: (1) the items represented student behaviors that lead to self-efficacy or learning and (2) the items could also reflect student behaviors of connectedness in an online classroom environment. Additional items reflected students' perceptions of others within the course and peer collaboration (Ko & Rossen, 2011). More specifically, "I perceive the other students not engaged with one another (e.g., have

conversations)" and "I believe it is not important to collaborate with other students in an online course."

The course-specific structural issues depicted in Table 1 (n = 19) focus on course design and construction. Ko and Rossen (2011) encourage online course designers to think carefully about the design of the course during the construction phase stating, "design really means the shape and the direction you want your course to take" (p. 46). Moreover, course designers must consider learning outcomes during all phases of designing the course. Considering the association between climate and learning outcomes, generating items that assess students' perceptions of course construction and delivery are necessary. Weber et al. (2011) note the importance of considering the association between students' perceptions of classroom procedural justice (i.e., fairness of course), expectations for grading practices, and course workload with students' perceived learning outcomes and motivation for the course and instructor (e.g., Chory, 2007; Chory-Assad & Paulsel, 2004; Mottet & Beebe, 2006). Hence, the items created for course-specific structural issues outline the course details (i.e., assignments, workload), course organization (i.e., clarity, navigation ease), and opportunities for discussion and collaboration (i.e., delivery and presence of instructor).

Variables such as clarity and relevance, which are generally conceived as an instructor behavior, (Chesebro & McCroskey, 2001; Frymier & Shulman, 1995) were conceptualized for this study as a function of course-specific structural issues since (1) the majority of the information dissemination was via mediated communication (i.e., the course shell, written instructions, video message) and (2) the selection and creation of readings, assignments, and lectures are typically developed and posted ahead of time

unlike the traditional course. An instructor teaching a traditional course could tailor or modify lessons, assignments, or readings to suit the student as the semester progresses. While this is a possibility for online instructors, much of the feedback in regard to course material relevancy and clarity is received at the end of the course with evaluations (Ko & Rossen, 2011). Thus, relevancy and clarity seem to be more a function of the course structure than instructor behavior.

The IBM proposes instructor behaviors, student characteristics and behaviors, and course-specific structural issues that impact the students' perception of their own academic self-efficacy. Thus, these items were generated based on the instructional communication literature that correlated each variable either to learning or to efficacy.

Table 1: Online Learning Climate Initial Item Pool

Instructor Behaviors
Based on my online interactions with the instructor,
I perceive my instructor as approachable (e.g., someone I would email or visit in virtual office hours).
I perceive my instructor as encouraging.
I perceive my instructor as supportive.
I perceive my instructor as in control of the class discussions.
I perceive my instructor as opened minded.
I perceive my instructor as unfair.
I perceive my instructor as sympathetic.
I perceive my instructor as engaged in the course.
I perceive my instructor as engaged with the other students.
I perceive my instructor as unorganized.
I perceive my instructor as a responsible person.
I perceive my instructor as a social person.
I perceive my instructor stories/details about his/her personal lives with the students.
I have met with my instructor for this online class (e.g., virtually or face-to-face)
I have seen my instructor in a recorded video message.
Student Characteristics and Behaviors
Based on my online interactions with the students in my class,

Table 1: Online Learning Climate Initial Item Pool (continued)

I perceive that I am the only student in class.
I perceive the other students as supportive for one another.
I perceive the other students as respectful for one another.
I perceive the other students socializing with one another.
I perceive the other students as not interested in one another.
I perceive the other students as comfortable with one another.
I perceive the other students as cooperative with one another.
I perceive the other students not engaged with one another (e.g., have conversations).
I perceive the other students engaged with me (e.g., have conversations).
I perceive the other students share stories/details about their personal lives with one another.
I believe it is important to have a connection with students in an online course.
I believe it is not important to collaborate with other students in an online course.
I would prefer to work alone in an online course.
Course-Specific Structural Issues
Based on my online experience with this course,
The content in this online class is busy work.
The delivery of the content meets my expectations for an online course.
The delivery of the content is confusing.
The presence of the instructor is apparent.
The course expectations are clear.
The course assignments are clear.
The organization of the course is clear.
The organization of the course is easy to navigate.
The organization of the course is engaging.
The technology for this course fosters collaboration with the other students.
The course content is not engaging.
The course assignments are not engaging.
The course assignments required collaboration with other students.
I watch the course videos/lectures.
I read the assigned readings.
This course met my expectations for an online course.
I believe online courses are more time consuming than traditional courses.
I believe online courses are more convenient.
I believe online courses provide ample opportunities for learning just like in a traditional course.

Part Two.

The next step in OLCS development consisted of a two-hour focus group session with a panel of experts (n =4). Each of these doctoral degree-holding experts from the fields of education, communication, and library science has conducted research regarding the online classroom, developed online courses, and/or taught graduate courses on online course development and pedagogy. The original forty-seven items were reviewed and revised based on critiques from the expert panel (DeVellis, 2012). During the review session, suggestions were made to revise double-barreled or double negative items, as well as to remove items that did not reflect the purpose of the scale.

First, the stem for each section of items was also revised to consistently reflect perception (i.e., "I believe" was changed to "I perceive"). These items were revised in this way to improve clarity.

Second, three instructor behavior items were removed (i.e., items: I perceive my instructor as a social person, I have met with my instructor for this online class (e.g., virtually or face-to-face), I have seen my instructor in a recorded video message). These were removed because they were beyond the focus of the proposed scale.

Third, three student behavior items were removed (i.e., items: I believe it is important to have a connection with students in an online course, I believe it is not important to collaborate with other students in an online course, and I would prefer to work alone in an online course). These were removed because they were beyond the focus on the proposed scale.

Fourth, nine course-specific structural issue items were removed (i.e., items: The content in this online class is busy work, The delivery of the content meets my

expectations for an online course, The course content is not engaging, The course assignments required collaboration with other students, I watch the course videos/lectures, I read the assigned readings, This course met my expectations for an online course, I believe online courses are more time consuming than traditional courses, and I believe online courses are more convenient). These items were removed because they were beyond the focus of the proposed scale.

Finally, seven items were added and five items where modified to the list. Those items added (i.e., items: I perceive my instructor as respectful toward me, I perceive my instructor as respectful toward the other students, I perceive my instructor as understanding, This online course provides ample opportunities for collaboration with the instructor, This online course provides ample opportunities for collaboration among students, This online course provides ample opportunities for communication with the instructor, and This online course provides ample opportunities for communication among students). Those items modified were to provide clarity (i.e., items: The design of this course fosters collaboration among students,
The technology used in this course fosters communication among students, The design of this course fosters communication among students, The course assignments do not promote engagement, and I perceive my instructor as personal (e.g., someone that shares personal stories/information to let me know about him or her).

In sum, 14 items were removed from the original list, seven items were added, five items were modified, and 29 items remained the same based on the expert panel discussion. A final approved list of items (n = 41) was established for the next steps of item generation (see Table 2).

Finally, the panel of experts suggested asking (a) students who have taken online classes and (b) faculty who have created or taught online classes to also review the scale items for language comprehension/intelligibility, missing items to add, and their overall impressions.

Table 2: Online Learning Climate Initial Items Approved by Panel of Experts

Instructor Behaviors
Based on my online class interactions with the instructor:
I perceive my instructor as approachable (e.g., someone I would email or visit in virtual office hours).
I perceive my instructor as encouraging.
I perceive my instructor as supportive.
I perceive my instructor is in control of the class discussions.
I perceive my instructor as opened minded.
I perceive my instructor as unfair.
I perceive my instructor as sympathetic.
I perceive my instructor as engaged in the course.
I perceive my instructor as engaged with the other students.
I perceive my instructor as unorganized.
I perceive my instructor as a responsible person.
I perceive my instructor as personal (e.g., someone that shares personal stories/information to let me know about him or her).
I perceive my instructor as respectful toward me.
I perceive my instructor as respectful toward the other students.
I perceive my instructor as understanding.
Student Characteristics and Behaviors
Based on my online class interactions with students in my class:
I perceive that I am the only student in class.
I perceive the other students are supportive of one another.
I perceive the other students as respectful of one another.
I perceive the other students are socializing with one another.
I perceive the other students as not interested in one another.
I perceive the other students as comfortable with one another.
I perceive the other students as cooperative with one another.
I perceive the other students as not engaged with one another (e.g., not having conversations).

Table 2: Online Learning Climate Initial Items Approved by Panel of Experts (continued)

I perceive the other students engaged with me (e.g., have conversations).
I perceive the other students are sharing stories/details about their personal lives with one another.
Course-specific Structural Issues
Based on my online experience with and perceptions of this course:
The delivery of course content is confusing.
The presence of the instructor is apparent.
The course expectations are clear.
The instructions for assignments are clear.
The organization of the course is clear.
The organization of the course is easy to navigate.
The organization of the course is engaging.
The technology used in this course fosters collaboration among students.
The design of this course fosters collaboration among students.
The technology used in this course fosters communication among students.
The design of this course fosters communication among students.
The course assignments do not promote engagement.
This online course provides ample opportunities for collaboration with the instructor.
This online course provides ample opportunities for collaboration among students.
This online course provides ample opportunities for communication with the instructor.
This online course provides ample opportunities for communication among students.

Part Three.

Per the suggestions made by the panel of experts, the next step entailed conducting two focus group sessions. One session was with students who had taken an online course (n =5). Another session was with faculty and staff that had either developed or taught online courses (n = 5). For each of these focus group sessions, both students and faculty were asked to review the OLCS items and respond to a series of prompts about the scale (see Appendix A). The research questions posed and procedures followed when conducting the focus groups are discussed in the following paragraphs.

Research Questions

The Online Learning Climate Scale (OLCS) was created based on the rationale and review of literature. The initial draft of the scale was reviewed and revised based on feedback from a panel of experts. Two additional focus groups were conducted – one with students that had taken an online course or courses, and one with faculty and staff that had developed or taught an online course or courses – to answer the following research questions:

RQ_{1a}: What impressions do students who have taken on online course have of the newly constructed online learning climate scale?

RQ_{1b}: What impressions do online course instructors or online course designers have of the newly constructed online learning climate scale?

Method

Participants

Undergraduate students (N = 5; 3 males, 2 females; M_{age} = 19.8, SD = 2.17; range 18 - 23 years) participated in phase one, part a. Participants reported their academic standing as either a first-year student (n = 2), sophomore (n = 1), or junior (n = 2). All students reported having been enrolled in and completed at least one online course.

Faculty members (N = 5; 2 males, 3 females; M_{age} = 33.2, SD = 1.79; range 31 - 35 years) also participated in phase one, part b. Participants reported their status as lecturer (n = 2), tenure track (n = 1), or staff (n = 2). Faculty reported teaching or developing at least one online course at an accredited university.

Procedures

For part a, potential student participants who volunteered to partake in the study

participated in a focus group. Students were recruited from lower division communication courses and received a research credit upon completion of the survey. The call for participants indicated that students must be over 18 and have taken at least one online course. Upon arrival to the research focus room, the purpose of the study was explained and consent requested. Students were encouraged to ask questions before beginning the session and were reminded that the session would be recorded. Students were also instructed to respond to questions using their participant number rather than their name to maintain anonymity.

After signing the consent form, students were asked general questions about classroom climate. For example, students were asked: "(1) What does online learning climate mean to you?, (2) How does it differ from traditional classroom climate?, (3) What does online learning climate look like?, (4) What are some specific ways to build climate in an online class?, and (5) How does climate impact the online classroom, if at all?"

Participants discussed the meaning of climate and decided it was an emotional connection among students, instructors, and the course. They also discussed how climate could potentially impact the classroom. Next, a handout describing the modified scale items was provided to each participant. Once again, students were asked to engage in a conversation about climate. However, the focus was on each specific item. Participants were asked the following questions: "(1) What do you think about the list?, (2) Which perceptions fit with your idea of online learning climate? Why?, (3) Which perceptions don't fit with your idea of online learning climate? Why?, (4) What is most surprising about the list, if anything?, and (5) What is missing from the list, if anything?"

The focus group conversation lasted 25 minutes. Students were thanked for their time and asked not to discuss the study with others.

For part b, faculty participants were recruited via e-mail and a networking sampling. Those that agreed to participate indicated their availability to participate via Doodle poll. Upon arrival to the research focus group room, the purpose of the study was explained and consent requested. Faculty participants were encouraged to ask questions before beginning the session and were reminded that the session would be recorded. In order to maintain anonymity, participants were instructed to respond using their randomly assigned participant number rather than their name.

Participants were asked the same questions about climate construction as participants in the student focus group. For example, participants were asked: "(1) What does online learning climate mean to you?, (2) How does it differ from traditional classroom climate?, (3) What does online learning climate look like?, (4) What are some specific ways to build climate in an online class?, and (5) How does climate impact the online classroom, if at all?"

After the participants discussed the meaning of climate and how it could potentially impact the classroom experience and learning outcome achieved, a handout describing the scale items approved by expert panel was provided to each participant. Once again, the faculty participants were asked to discuss climate only this time the focus was on each specific item. Participants were asked the following questions: "(1) What do you think about the list?, (2) Which perceptions fit with your idea of online learning climate? Why?, (3) Which perceptions don't fit with your idea of online learning climate? Why?, (4) What is most surprising about the list, if anything?, and (5) What is missing

from the list, if anything?" The focus group conversation lasted 45 minutes. The faculty and staff participants were thanked for their time and asked not to discuss the study with others.

Results

Research Question One (Part A and B)

In order to answer both parts of research question one, two focus groups were conducted. Based on the results of these focus group sessions (one with students and one with faculty) a definition of online learning climate, a list of scale items, and directions were established. Both focus groups ultimately decided "the emotional atmosphere, feeling, and or connection in the course with the instructor and students" would suffice as a definition for online learning climate. Based on the conversations with each group, several revisions were made to the OLCS items.

Both the student and faculty focus group participants described climate as a connection and feeling of being comfortable. The subsequent examples provided from each groups varied. Students discussed how climate relates to the instructor while faculty discussed climate as a function of course set-up.

One student remarked that the statements seemed "a little long" and he "would not read the statements because it was overwhelming." Others agreed. He suggested taking the repetitive words out (i.e., adding to the stem). Thus, the stems were added and tags condensed (see Table 3). Ultimately, the students indicated the list seemed "complete" regarding what comprises online climate.

Another revision to the final list of items included "me" focused statements in the student characteristics section. Faculty and staff questioned whether the actual student's

perception of self within the course was considered – "what about the student's perception of his or her actions?" Originally this was not included in the list of student characteristics since most of the student characteristics and instructional communication literature focuses on students' perceptions of other students (see Dwyer et al., 2004). Other revisions and additions to items from the faculty and staff focus group conversations were based on instructor behaviors.

Faculty Member A: "What about the students' perceptions of timeliness with grading assignments and feedback?"

Faculty Member B: "Or even with email responses?"

The faculty participants remarked that there should be items for timeliness in responding to email questions, as well as effective grading and responsive feedback on assignments. They explained that online students have certain expectations about how online instructors and online courses should function. One faculty member remarked that not all students are as computer savvy as we think and creating a course that is easy to navigate with clear directions is important to consider.

Finally, a set of directions was added to clearly inform participants about how to complete the scale. Based on the focus group sessions, the following directions were constructed for the survey: "Think about an online class that you are currently enrolled in and rate the following statements as (1) strongly disagree to (7) strongly agree. This online class will be the target class for all your responses. When you think about the online class, consider the climate (e.g., the emotional atmosphere, feeling, and or connection in the course with the instructor and students)."

In sum, these changes were made based on the student and faculty/staff focus

group sessions. A final list of items (n = 53) was presented, discussed, and confirmed with the dissertation advisor before submitting a modification to the institutional review board (see Table 3).

Table 3: Online Learning Climate Initial Item Pool Based on Focus Groups Feedback

Instructor Behaviors
Based on my online class interactions with the instructor, I perceive my instructor:
As approachable (e.g., someone I would email or visit in virtual office hours).
As encouraging.
As supportive.
Is in control of the class discussions.
As opened minded.
As unfair.
As sympathetic.
As engaged in the course.
As engaged with the other students.
As unorganized.
As a responsible person.
As personal (e.g., someone that shares personal stories/information to let me know about him or her).
As respectful toward me.
As respectful toward the other students.
As understanding.
As a timely person (e.g., someone who responds to emails within a timely manner).
As efficient grader (e.g., returns assignments within an appropriate amount of time).
As responsive (e.g., provides feedback on assignments).
Student Characteristics and Behaviors
Based on my online class interactions with students in my class, I perceive:
I am the only student in class.
Students are supportive of one another.
Students as respectful of one another.
Students are socializing with one another.
Students as not interested in one another.
Students as comfortable with one another.
Students as cooperative with one another.
Students as not engaged with one another (e.g., not having conversations).

Table 3: Online Learning Climate Initial Item Pool Based on Focus Groups Feedback (continued)

Students engaged with me (e.g., have conversations).
Students are sharing stories/details about their personal lives with one another.
I am supportive of the other students.
I am respectful of the other students.
I am socializing with other students.
I am not interested in the other students.
I am comfortable with the other students.
I am cooperative with the other students.
I am sharing stories/details about my personal lives with the other students.
Course-Specific Structural Issues
Based on my online experience with and perceptions of this course:
The delivery of course content is confusing.
The presence of the instructor is apparent.
The course expectations are clear.
The instructions for assignments are clear.
The instructions for use of technology are clear.
The organization of the course is clear.
The organization of the course is easy to navigate.
The organization of the course is engaging.
The technology used in this course fosters collaboration among students.
The design of this course fosters collaboration among students.
The technology used in this course encourages student interaction with students.
The design of this course encourages student interaction with students.
The design of the course is visually pleasing.
The course assignments do not promote engagement.
This online course provides ample opportunities for collaboration with the instructor.
This online course provides ample opportunities for collaboration among students.
This online course provides ample opportunities for communication with the instructor.
This online course provides ample opportunities for communication among students.

Summary

Based on the review of literature, insight provided by a panel of experts, and both student and faculty/staff (i.e., course designers and instructors) focus groups, a finalized

list of scale items was created. This newly developed OLCS would now be tested using an exploratory factor analysis to assess (a) underlying factorial structure as suggested by Morrison (2009) and Noar (2003), as well as the (b) concurrent and (c) convergent validity.

CHAPTER FOUR: PHASE TWO - EXPLORATORY FACTORIAL ANALYSIS, CONCURRENT AND CONVERGENT VALIDITY

The second phase of this dissertation project tested the factorial structure, as well as the concurrent and convergent validity of the OLCS. This chapter describes the rationale, methods and procedures used, as well as results from this phase of the dissertation project.

Rationale

An exploratory factorial analysis was conducted to establish the factorial structure of the OLCS (Noar, 2003). Levine (2005) explains that factorial tests are often misused when examining scales because researchers are unsure of the different purposes of exploratory and confirmatory analyses. Levine calls for researchers to determine the purpose before choosing a form of analysis. Exploratory factor analyses are appropriate for new scales focused on understudied communication constructs such as online learning climate. Both Kline (2011) and Noar highly encourage researchers to then verify their results with a confirmatory factor analysis once an exploratory factor analysis has been established.

Most of the current scale development work in instructional communication relies on concurrent and discriminant validity measures to validate newly constructed scales. Thus, concurrent and discriminant validity tests were conducted to (1) establish that the OLCS measures the variables it proposes to measure as unique to other validated climate scales and (2) establish that the scale is not measuring constructs it is not intended to measure (i.e., accounting for other variables not claimed within the scale's description).

Concurrent Validity: Learning Outcomes

To determine whether the OLCS actually measures what it is designed to measure, a concurrent validity test was employed (DeVellis, 2012). Three learning outcome variables (i.e., affective, cognitive, and behavioral) were used to determine concurrent validity.

When a student reports they enjoy an instructor or a class, they have positive affect toward the instructor or class. Affective learning is "a students' attitudes, beliefs, and values toward the knowledge and skills the student has acquired" (Nussbaum & Scott, 1980, p. 554). Affective learning positively impacts cognitive learning according to the affective learning model (ALM) proposed by Rodriguez, Plax, and Kearney (1996). The model outlines how affective learning mediates the relationship between instructor behaviors (e.g., immediacy, disclosure) and students' perception of cognitive learning. For example, when an instructor uses immediacy with his or her students (i.e., student first names, inquires about day), the student may report liking the instructor or course and then also report that he or she has learned from the instructor or course.

Cognitive learning is conceptualized and operationalized in two ways within instructional communication research and practice. The first defines and examines cognitive learning as students' perceptions of content learned in a course (Frisby & Martin, 2010). The second defines and examines how a student actually understands, applies, and retains information (Bloom, 1956). The ability to measure and account for a students' knowledge attainment, using perceived cognitive scales has been a debatable topic (King & Witt, 2009). Thus, examining cognitive and behavioral learning may provide a clearer picture of what students actually learn, retain, and apply.

Behavioral learning is conceptualized in a variety of ways but most often on student self-reports reports or assessment of student work (Yu, 2012). Self-report data is based on behavioral intentions about how students intend to use what they learned in the course. Assessment of actual student work is more desired and authentic, however, this approach is often not collected and examined due in part to: (1) privacy constraints, (2) the time consuming nature of collecting the artifacts, and (3) the training necessary to achieve intercoder reliability (Yu, 2012).

For the purposes of this three-phase study, examining students' reported behavioral intentions provides insight to the student's perception of his or her intended likelihood of actually attempting to engage in the behaviors taught during the course.

Given that positive classroom climate in traditional settings is correlated to affective, cognitive, and behavioral learning outcomes, this phase seeks to validate the OLCS using these learning outcomes as variables.

Convergent Validity: Traditional Classroom Climate

In order to establish convergent validity, the proposed instrument should positively correlate with a previously validated scale measuring the same construct (Campbell & Fiske, 1959). To do so, two traditional classroom climate scales were tested and compared to the OLCS: Connected Classroom Climate Inventory (CCCI) and Class Climate Scale (CCS). Since the OLCS purports to measure online learning climate and the online classroom is viewed as a place of learning much like the traditional classroom, the CCCI and CCS should be related.

Connected classroom climate inventory.

Dwyer et al.'s (2004) connected classroom climate inventory (CCCI) represents

students' and instructors' perceptions of student-to-student communication as it contributes to positive traditional classroom climate. They posit that positive perceptions of student-to-student connectedness in the classroom result in a positive perception of classroom climate. Dwyer and colleagues' found that high student-to-student communication and connectedness related to a positive perception of traditional classroom climate. These results exemplify the importance of encouraging students to build relationships with one another in a learning context. The confirmed scale, validated by Ifert Johnson (2009), is a unidimensional, 13-item measure that assesses the students' perceptions of their connectedness with other students and traditional classroom climate.

Class climate scale.

Gokcora's (1989) class climate scale (CCS) assesses students' perceptions of the instructor's communicative behaviors. Mazer et al. (2007) used a modified version of Gokcora's sematic differential climate scale to examine disclosure, instructor-student relationship, and classroom climate using Facebook within a traditional classroom setting. Mazer et al. found that disclosure, Facebook use, and climate were all positively impacted when the disclosures and Facebook interactions were appropriate and positive. They claim students may feel more connected to the instructor and classroom because of this connectivity and, thus, learning outcomes may be positively influenced.

Research Questions and Hypotheses

The following research question and hypotheses were posed based on the creation of the OLCS and discussions from phase one:

RQ_2: What kind of reliable factor structure for perceived online learning climate

(OLCS) can be achieved?

H_1: OLCS is associated positively with student reports of affective learning.

H_2: OLCS is associated positively with student reports of cognitive learning.

H_3: OLCS is associated positively with student reports of behavioral intentions.

H_4: OLCS is associated positively with classroom climate scale (CCS).

H_5: OLCS is associated positively with connected classroom climate inventory (CCCI).

Method

Participants

Undergraduate students (N = 236; 145 males, 90 females, one participant did not respond; M_{age} = 20.2, SD = 2.06; range 18 - 33 years) participated in phase two. Participants reported their academic standing as a first-year student (n = 59), sophomore (n = 64), junior (n = 63), senior (n = 48) and two students did not identify their current academic status. Participants identified as White/Caucasian (n = 180), with the remaining participants identifying as African American (n = 30), Asian (n = 8), Hispanic/Latino (n = 5), Other (n = 12), and four students did not report their ethnicity. A total of 143 students reported completing at least one online course, while (n = 43) completed at least two courses, (n = 22) completed at least three courses, and (n = 28) completed four or more online courses.

Procedures

Procedures for phase two received approval from the university's Institutional Review Board. Participants volunteered to partake in the study and complete an online Qualtrics survey. Students were recruited from lower division communication courses

and received a research credit upon completion of the survey. The call for participants indicated that students must be over 18 and have taken at least one online course. The survey was open for three weeks (i.e., the eleventh, twelfth and thirteen week of the semester). Potential participants received two reminder emails about completing the survey.

Upon completion of the consent form, students were encouraged to think about their most recent experience with an online course for all the measures (i.e., the online learning scale, connected classroom climate inventory, classroom climate scale, affective learning, behavioral intentions, and cognitive learning). The survey was designed to take up to 15 minutes to complete. Students completed demographic information before concluding the survey. Once the survey was completed, students were thanked for their time and the research credit was automatically assigned.

Measures

Connected classroom climate inventory.

Dwyer et al.'s (2004) classroom connected inventory represents students' and instructors' perceptions of the student-to-student behaviors that contribute to positive traditional classroom climate. Using the validated version of Dwyer and colleagues' scale (Ifert Johnson, 2009), which includes a 13-item Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Questions ranged from: "I have common ground with my classmates" to "I feel a strong bond with my classmates" to "The students in my class share stories and experiences with one another" and "The students in my class are friendly with one another." Ifert Johnson reported alpha reliability over .90. For the current study, $\alpha = .95$ ($M = 39.75$, $SD = 10.33$) for students' perceptions of class

connectedness and climate.

Classroom climate.

Gokcora's (1989) scale assessed students' perceptions of the instructor's communicative behaviors in specific scenarios. The 10-item semantic differential scale measures students' perceptions of variables such as approachability, sense of humor, and class atmosphere in the classroom. Gokcora stated the higher the number, the more positive the perceived classroom climate. The reported alpha reliability for this study was .75 (Mazer et al., 2007). For the current study, $\alpha = .77$ ($M = 61.60$, SD = 12.90) for students' perception of classroom climate.

Affective learning.

Using the Affective Learning Scale (Andersen, 1979), students reported their impressions of the instructor, course, and content using a four-item semantic scale. Previous alpha reliabilities for the summed affective learning scale have ranged from .86 to .98 (see Gorham, 1988; Richmond, 1990). For the current study, $\alpha = .82$ ($M = 20.94$, $SD = 4.36$) for students' liking of the content, $\alpha = .94$ ($M = 17.40$, $SD = 6.92$) for students' liking of the course, $\alpha = .89$ ($M = 20.59$, $SD = 5.37$) for students' liking of the instructor, and $\alpha = .92$ ($M = 58.97$, $SD = 14.31$) for the summed scale.

Cognitive learning.

Students reported their perceived cognitive learning using Frisby and Martin's (2010) cognitive learning scale. Students rated ten recall and understanding statements about the class using a five point Likert-type scale of 1 (strongly disagree) to 5 (strongly agree). Five items were reverse coded. According to Frisby and Martin, the alpha reliability reported for the scale is .88. For the current study, $\alpha = .85$ ($M = 34.47$, $SD =$

6.35) for students' perceptions of cognitive learning.

Behavioral learning.

Behavioral learning was measured by student self-reports of their behavioral intentions. Students reported their behavioral intentions for the use of the online course material using a five-item scale. The measure asked students to respond about the online course using a seven semantic differential items. Three items were reverse coded. For the current study, $\alpha = .90$ ($M = 19.62$, $SD = 5.31$) for high application of behavioral learning outcome.

Data Analysis

To test the proposed research question, an exploratory factor analysis was employed. An exploratory factor analysis without Varimax rotation incorporated McCroskey and Young's (1979) four guidelines: (a) minimum Eigenvalue of 1.0; (b) loading of .60 on one factor but less than .40 on the other factor; (c) does not cross load; and (d) accounts for at least 5% of the variance. To best answer the proposed hypotheses regarding convergent and concurrent validity, zero-order Pearson correlations were conducted.

Results

Research Question Two

Research question two investigated the reliability and factor structure of the newly developed Online Learning Climate scale. For the first factorial analysis, 37 items did not meet the 60/40 criteria because they cross-loaded and, thus, were deleted. A subsequent factorial analysis was conducted to ensure that all of the remaining items would load according to the preset parameters. After running the second factorial

analysis, two items did not meet the 60/40 criteria because they cross-loaded and, thus, were deleted. A final factorial analysis was conducted on the remaining items. A total of 14 items remained (see Table 4). These items produced a single factor with an Eigenvalue of 8.28.

In sum, the final exploratory principal components factor analysis (see Table 4) produced a fourteen-item unidimensional scale that accounts for approximately 59% of the variance (*M* = 68.20, *SD* = 15.43, Kurtosis = .331, Skewness = -.647). The scale produced a high internal reliability with a Cronbach's alpha of .95.

Table 4: Online Learning Climate Scale with Means, Standard Deviations, and Factor Loadings

	Mean	Std. Deviation	Factor Loading
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As approachable (e.g., someone I would email or visit in virtual office hours).	5.03	1.545	.832
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As encouraging.	5.00	1.465	.902
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As supportive.	5.01	1.432	.886
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR:-In control of the class discussions.	4.94	1.475	.682
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As opened minded.	5.00	1.406	.815

Table 4: Online Learning Climate Scale with Means, Standard Deviations, and Factor Loadings (Continued)

BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As sympathetic.	4.47	1.454	.768
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As engaged in the course.	5.07	1.468	.844
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As engaged with the other students.	4.78	1.588	.841
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As a responsible person.	5.40	1.136	.740
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As respectful toward the other students.	5.35	1.212	.625
BASED ON MY EXPERIENCES WITH AND PERCEPTIONS OF THIS ONLINE COURSE: -The presence of the instructor was apparent.	4.59	1.542	.626
BASED ON MY EXPERIENCES WITH AND PERCEPTIONS OF THIS ONLINE COURSE: -This online course provided ample opportunities for collaboration with the instructor.	4.25	1.521	.733
BASED ON MY EXPERIENCES WITH AND PERCEPTIONS OF THIS ONLINE COURSE: -This online course provided ample opportunities for communication with the instructor.	4.64	1.466	.720

Table 4: Online Learning Climate Scale with Means, Standard Deviations, and Factor Loadings (Continued)

BASED ON MY EXPERIENCES WITH AND PERCEPTIONS OF THIS ONLINE COURSE: -The organization of the course was engaging.	4.67	1.410	.685

Extraction Method: Principal Component Analysis.

1 component extracted.

Hypotheses One through Three: Concurrent Validity

In order to establish concurrent validity of the scale, hypotheses one through three posited positive correlations with the three types of learning outcomes. More specifically, hypothesis one predicted a positive association between the OLCS and combined three types of affective learning. This was confirmed [$r = .621$, $p = .000$]. Hypothesis two predicted a positive association between the OLCS and behavioral learning (collected via self-reported behavioral intentions). This was confirmed [$r = .410$, $p = .000$]. And lastly, hypothesis three predicted a positive association between the OLCS and cognitive learning. This was also confirmed [$r = .600$, $p = .000$] (see Table 5).

Table 5: Concurrent Validity Correlations

	1	2	3	4	5	6	7
Online Learning Climate Scale							
Combined Affective Learning	.621**						
Affective Learning for Course	.580**	.867**					
Affective Learning for Content	.456**	.855**	.579**				
Affective Learning for Instructor	.597**	.856**	.754**	.519**			
Behavioral Intentions	.410**	.571**	.503**	.487**	.491**		
Cognitive Learning	.600**	.708**	.662**	.581**	.599**	.455**	

**. Correlation is significant at the .01 level (2-tailed).

Hypotheses Four and Five: Convergent Validity

In order to establish convergent validity, hypotheses four and five posited a positive association between the OLCS and two traditional classroom climate scales. More specifically, hypothesis four suggested a positive association between the online learning climate scale (OLCS) and the class climate (CC) scale. This was confirmed [r = .429, p = .000]. Hypothesis five posited a positive association between the OLCS and the connected classroom climate inventory (CCCI) scale. This was confirmed [r = .654, p = .000] (see Table 6).

Table 6: Convergent Validity Correlations

	1	2	3
Online Learning Climate Scale (OLCS)			
Connectedness Classroom Climate Inventory (CCCI)	.429**		
Classroom Climate Scale (CCS)	.654**	.467**	

**. Correlation is significant at the .01 level (2-tailed).

Summary

In sum, findings from phase two suggest that the OLCS is a parsimonious, reliable, valid14-item scale. The scale's convergent validity confirms that the scale measures classroom climate in the online context. The positive and moderately strong associations between the proposed OLCS and the two traditional climate scales, CCCI and CCS, suggest that the scales are similar. The concurrent validity results support that the OLCS correlated in an appropriate and "conceptually meaningful direction" (King, Schrodt, & Weisel, 2009, p. 14). In other words, the scale performed as hypothesized.

Thus, the scale measures variables similarly to other validated climate scales. Hence, the next step is to test whether the OLCS is in fact unique from the two previous validated scales as it measures climate in an online setting. To do so, a discriminant validity test would next be conducted.

CHAPTER FIVE: PHASE III - CONFIRMATORY FACTOR ANALYSIS, DISCRIMINANT AND PREDICTIVE VALIDITY

The third and final phase sought to confirm the factorial structure of the OLCS, as well as establish the discriminant validity of the scale. This final phase tested the OLCS as an indicator of student beliefs about classroom climate in an online learning environment, as well as tested three theoretical models. This chapter describes the rationale, methods, and procedures used to conduct this phase followed by a discussion of results.

Rationale: Confirming the Factorial Structure of OLCS

In order to confirm that the factorial structure of a scale is sound, both Levine (2005) and Noar (2003) recommend verifying the exploratory factor analysis with a follow-up confirmatory factor analysis. One shared goal of for both factorial analyses is the establishment of a factorial structure of correlations (Morrison, 2009). Doing so creates a stronger argument for the validity of the scale's structure (Morrison, 2009). Hence, verifying the factorial structure of the OLCS using a confirmatory factor analysis will establish the "confirmed specific pattern pre-established by theory" (DeVellis, 2012, p. 148) and will provide stronger support for construct validity.

Discriminant Validity: Traditional Classroom Climate

Farrell and Rudd (2009) encourage researchers to validate a scale using discriminant validity, especially if there is a "possibility for highly construct inter-correlations" (p. 5). As was revealed in phase two of this study, the OLCS and the classroom climate scales (CCCI and CCS) created for use in the traditional classroom were correlated. These results suggested that the proposed scale is not in fact the same as

one or both of the traditional climate scales. This phase tests for multicollinearity and for any significance difference between the established measures and the proposed scale.

The two established climate scales were created to measure the perceived climate in a traditional classroom and in a traditional classroom with mediated components (i.e., a face-to-face class that incorporates computer-mediate technologies like Facebook (Mazer et al., 2007). Although not identical, the two scales do contain some similar items as those included in the OLCS. This is so because those variables (i.e., item phrasing) worked well within the online medium (e.g., instructor role – I perceived my instructor as engaged in the course). As noted by Campbell and Fiske (1959) and others (e.g., Goodboy, Martin, & Bolkan, 2009; Mazer & Thompson, 2011), positive correlations between constructs indicate similarity, or convergent validity. Thus, it is important to then assess that those factors are measuring discriminant constructs.

Validity may be determined by employing a confirmatory factorial analysis specifying that the factors the OLCS are distinct from those in the CCCI and CCS scales. According to Hinkin (1998) and Kline (2011), an acceptable model fit should assess the: (a) model chi-square, (b) the root mean square error of approximation (RMSEA), (c) the normed fit index (NFI), and (d) the comparative fit index (CFI).

Connected classroom climate inventory.

Dwyer et al.'s (2004) connected classroom climate inventory (CCCI) represents students' and instructors' perceptions of student-to-student communication as they contribute to classroom climate in the traditional face-to-face settings. They posit that positive perceptions of student-to-student connectedness result in a positive classroom climate. These results exemplify the importance of encouraging students to build

relationships with one another. Ifert Johnson (2009) confirmed these findings and concluded that "connected classroom climate is associated with affective learning and teacher immediacy" (p. 155).

Class climate scale.

Gokcora's (1989) class climate scale (CCS) assesses students' perceptions of the instructor's communicative behaviors. Mazer and colleagues (2007) used a modified version of Gokcora's sematic differential climate scale to examine how disclosure, instructor-student relationships, and the use of Facebook influence climate in a traditional classroom setting. Mazer et al. found that disclosure, Facebook use, and climate were all positively correlated with climate when the disclosures and Facebook interactions were appropriate and positive. They claim that students may feel more connected to both the instructor and the class. Learning outcomes may be positively influenced as a result. They explain that "Facebook is a contemporary technological tool that can offer teachers and students a unique method to nurture the student-teacher relationship, which can ultimately create a positive learning experience for both parties" (p. 15).

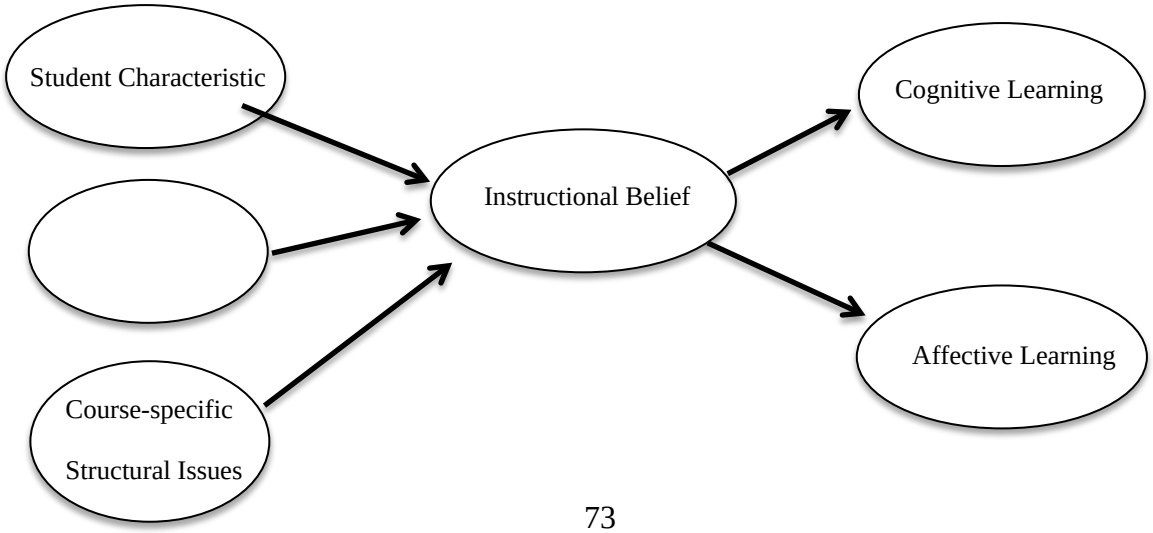
Predictive Validity: Models of Online Learning and IBM

Weber, Martin, and Myers (2011) call to extend their instructional beliefs model by testing additional variables within the first order and the second order constructs. Given this call, the final phase of this study examined online learning climate using the following variables: instructor disclosure, student willingness to talk, and classroom procedural justice. Regarding instructional belief, learner empowerment was used similarly as Weber et al., to capture the student's self-efficacy. Affective, cognitive, and behavioral learning outcomes were also included.

This study used the following as first-order variables: Instructor disclosure (Cayanus & Martin, 2008) represented the instructor behavior construct. Student willingness to talk (Menzel & Carrell, 1999) represented the student behavior construct. Classroom procedural justice (Chory-Assad & Paulsel, 2004) represented the course-specific structural issues construct. Moreover, student willingness to talk (i.e., to engage with others in the online course) reflects student perceptions of connectedness (Dwyer et al., 2004). Instructor disclosure captures the positive or negative perceptions students have about disclosive statements and their potential impact on the climate.

Regarding the second-order constructs, a revised learner empowerment scale (Weber, Martin, & Cayanus, 2005) represented students' instructional beliefs. Third-order constructs are learning outcomes. Affective learning (i.e., perceived liking for the course and instructor) was measured using Andersen's (1979) affective learning scale. Perceived cognitive learning was measure using Frisby and Martin's (2010) cognitive learning measure. To measure behavioral learning, Christophel's (1990) behavioral intentions scale was employed (see Figure 1 for original IBM).

Figure 1: Original Instructional Beliefs Model



Research Questions and Hypotheses

Based on a comprehensive review of related literature and the results from phases one and two of this dissertation, the following research questions and hypotheses were posited for phase three:

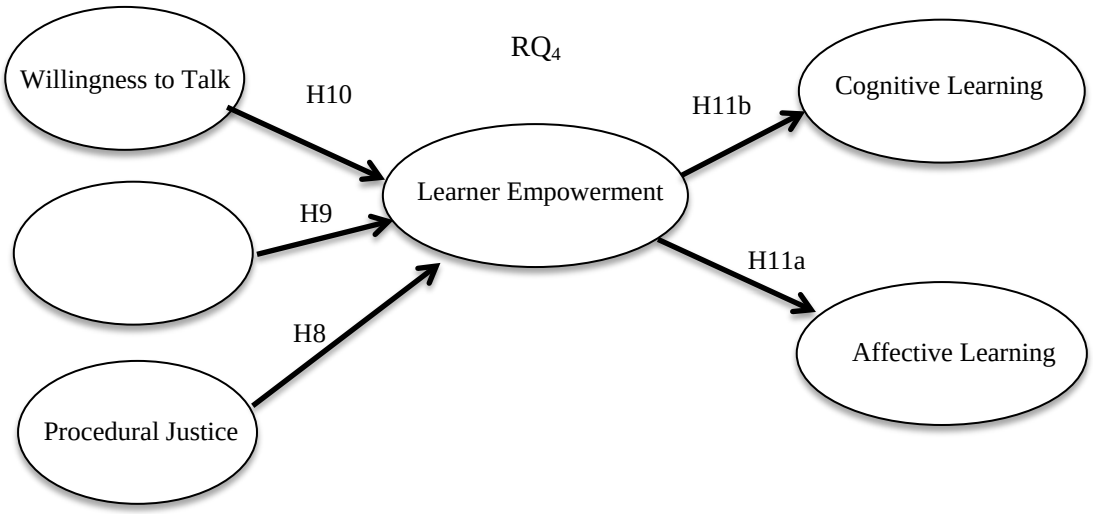
RQ_3: Can the factorial structure of the online learning climate scale (OLCS) be replicated?

H_6: OLCS is a distinct measure from the connected classroom climate inventory (CCCI).

H_7: OLCS is a distinct measure from the classroom climate scale (CCS).

The following hypotheses test an alternate (i.e., modified) version of the Instructional Beliefs Model using different variables than those noted within the original Weber, Martin, and Myers' (2011) model. Doing so addresses their call to extend the model with further testing of variables within the established constructs an alternate model with adapted variables for online classroom context (see Figure 2).

Figure 2: Alternate Model with Adapted Variables for Online Classroom Context



H_8: Classroom procedural justice will predict learner empowerment.

H_9: Appropriate instructor disclosure will predict learner empowerment.

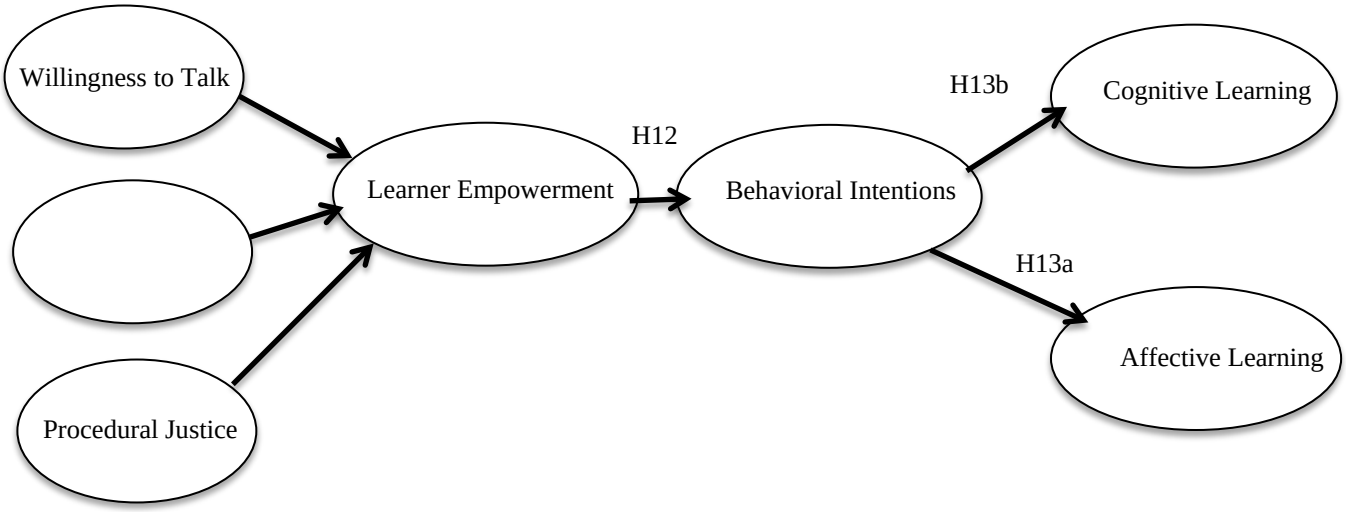
H_{10}: Student willingness to talk (i.e., engage) will predict learner empowerment.

H_{11}: Learner empowerment will predict (a) affective and (b) cognitive learning.

RQ_4: Based on the proposed hypotheses [H_8- H_{11}], can the alternate model with adapted variables for online classroom context be supported?

Finally, the following hypotheses and research question test two additional alternate models that extend Weber, Martin, and Myers' (2011) Instructional Beliefs Model (see Figure 3 and 4). More specifically, Figure 3 includes the behavioral learning variable and Figure 4 includes the climate variable.

Figure 3: Alternate Model with Adapted Variables for Online Classroom Context

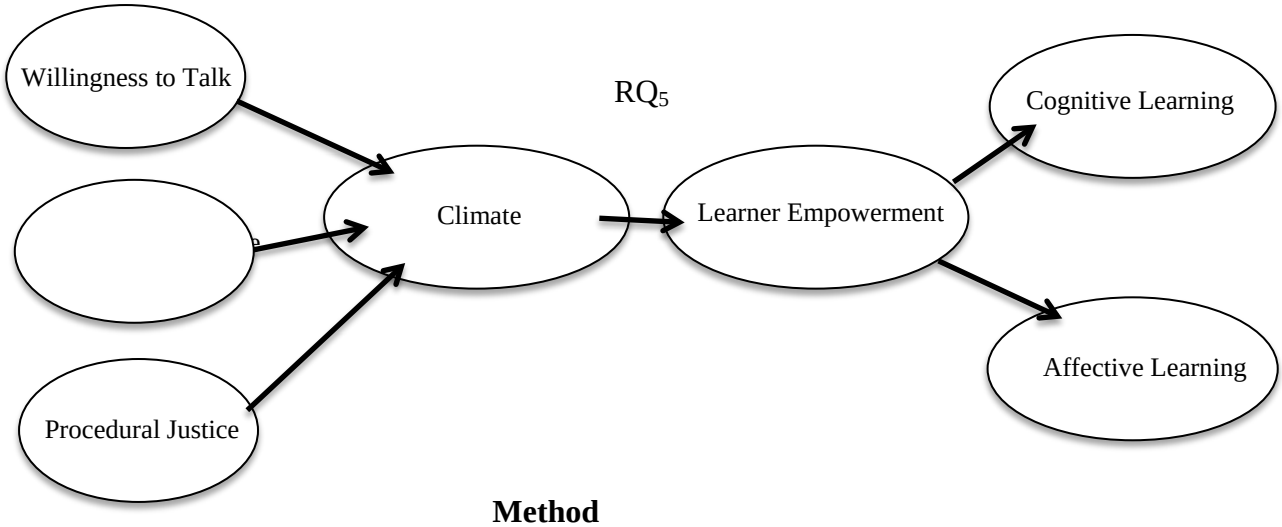


H_{12}: Learner empowerment will predict student self-reported behavioral intentions.

H_{13}: Student self-reported behavioral intentions will predict (a) affective and (b) cognitive learning.

RQ_5: How does a student perception of climate influence the alternative model?

Figure 4: Alternative Model with Climate Construct and Adapted Variables for Online Classroom Context



Method

Participants

A total of 129 students (N = 129; n=30 males, n=90 females; M_{age} = 27.82, SD = 8.76; range 18 - 67 years) participated in phase three. Participants reported their academic standing as a first-year student (n = 6), sophomore (n = 10), junior (n = 29), senior (n = 30), or graduate student (n = 38) while (n = 5) did not report education status. Participants identified as White/Caucasian (n = 96), with the remaining participants identifying as African American (n = 16), Asian/Pacific Islander (n = 5), Hispanic/Latino (n = 6), Other (n = 4) and (n =2) did not report ethnicity. Students reported either full-time (n = 96) or part-time status (n = 36) at a university type as either: four year college/university (n = 122), two year community college (n = 7), and as private (n = 4), public (n = 124), or for-profit (n = 1). A total of (n = 96) students reported full-time states, while (n = 33) reported part-time status. Students were enrolled universities

located in ten different U.S. states.

Procedures

Procedures for phase three received approval from the university's Institutional Review Board. Participants were recruited via two online data collection rounds. For the first data collection round, participants who were currently enrolled in an online course at a large Midwestern university were invited to partake in the online Qualtrics study via email. The Office of Distance Learning, as well as chairs and directors of all programs that offer fully online courses (as opposed to hybrid versions) at a large Midwestern university, were contacted via email and asked to forward the survey to online instructors and their students. Recruitment emails were sent during the 8th and 9th week of the semester (i.e., March 4 – 14, 2014). This round of data collection occurred after midterm exams but before Spring Break. Students were allotted two weeks to complete the survey. Online instructors received two emails reminding them about the survey opportunity. In total, 50 surveys were completed during the first round of data collection.

In an attempt to increase the number of surveys complete, a second round of data collection was employed. A snowball/network sampling approach was used for this round. Emails were sent to the Basic Course Listserv (i.e., an email listserv for basic communication course directors across the U.S.). Requests were also posted on PsyResearch and the PI's Facebook page. Recruitment emails were also sent to a university that offers many online courses via a recommendation from a campus colleague. A total of 79 participants completed surveys between March 31, 2014 and April 15, 2014. Thus, 50 surveys collected in the first round and 79 collected in the second round garnered a total of 129 surveys to be examined for phase three of this study.

For both data collection rounds, interested students were instructed to click a link that directed them to an informed consent page. Upon completion of the consent form, students were directed to the survey. They were encouraged to think about their current experience with their online course for all measure. The survey was designed to take 15 to 20 minutes to complete. Students answered several demographic information questions at the end of the survey. Participants received no compensation for participating in the study.

Measures

Affective learning.

Students reported their impressions of the content, course, and instructor using a four-item semantic differential scale. Previous alpha reliabilities for the summed affective learning scale have ranged from .86 to .98 (see Gorham, 1988; Richmond, 1990). Alpha reliabilities for the current study were as follows: $\alpha = .91$ ($M = 24.39$, $SD = 4.54$) for students' liking of the content, $\alpha = .97$ ($M = 22.88$, $SD = 6.60$) for students' liking of the course, and $\alpha = .89$ ($M = 25.30$, $SD = 4.25$) for students' liking of the instructor.

Cognitive learning.

Students reported their perceived cognitive learning using Frisby and Martin's (2010) cognitive learning scale. Students rated ten recall and understanding statements about the class using a five point Likert-type scale of 1 (strongly disagree) to 5 (strongly agree). Five items were reverse coded. According to Frisby and Martin, the alpha reliability reported for the scale is .88. For the current study, $\alpha = .87$ ($M = 39.90$, $SD = 6.61$) for student perceptions of cognitive learning.

Behavioral learning.

Students reported their behavioral intentions for the use of the online course material using a five-item semantic differential scale. Three items were reverse coded. Previous alpha reliability for this scale was α =. 93 (Christophel, 1990). For the current study, α = .95 (*M* = 24.46, *SD* = 5.04) for student behavioral intentions (a.k.a. behavioral learning).

Classroom connectedness.

Dwyer and colleagues' (2004) classroom connected inventory represents student perceptions of connectedness in a traditional classroom. They did so by completing the 13-item Likert-type scale (Ifert Johnson, 2009) ranging from 1 (strongly disagree) to 5 (strongly agree). Questions ranged from "I have common ground with my classmates" and "I feel a strong bond with my classmates" to "The students in my class share stories and experiences with one another" and "The students in my class are friendly with one another." Ifert Johnson reported alpha reliability over .90. Alpha reliability for the current study was α = .91 (*M* = 45.59, *SD* = 9.66) for student perceptions of class connectedness.

Classroom climate.

A modified version of Gokcora's (1989) scale was used to assess student perceptions of the instructor's communicative behaviors in specific scenarios. The 10-item semantic differential scale measures students' perceptions of variables such as approachability, sense of humor, and class atmosphere within the classroom. The higher the number, the more positive the perceived classroom climate. The reported alpha reliability for the modified scale was .75 (Mazer et al., 2007). Alpha reliability for the current study was α = .89 (*M* = 77.71, *SD* = 16.55) regarding student perceptions of

classroom climate.

Classroom procedural justice.

Students reported their perception of classroom policy and procedural fairness using a portion of Chory-Assad and Paulsel's (2004) Classroom Procedural Justice scale. This portion of the scale measures student perceptions of fairness about the course procedures and structure. Students rated 17 statements using a five point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). According to Weber, and colleagues (2011), the alpha reliability reported for this scale was over .91. Alpha reliability for the current study was α = .95 (M = 68.53, SD = 12.28) for student perceptions of classroom procedural justice.

Learner empowerment.

To determine academic self-efficacy or instructional beliefs for the course, students reported their perceptions of learner empowerment using a shortened version of the Learner Empowerment scale (Weber, Martin, & Cayanus, 2005). Students rated 18 statements about the class using a five point Likert-type scale ranging from 0 (never) to 4 (very often). Six items were reverse coded. Weber and colleagues (2005) reported alpha reliabilities as follows: impact α = .81, meaningfulness α = .88, and competence α = .85. The alpha reliabilities for this study were: α =. 76 (M = 17.94, SD = 5.08) for impact, α =. 86 (M = 21.47, SD = 4.77) for meaningfulness, and α =. 81 (M = 22.96, SD = 3.87) for competence.

Online learning climate.

Students reported their perception of online learning climate using the online learning climate scale (OLCS). Students responded to 14 statements about the class using

a seven point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Phase two of the study had a reliability factor of α = .95 (M = 68.20, SD = 15.43) for student perceptions of online learning climate. Alpha reliability for phase three was α = .96 (M = 84.45, SD = 14.93) for student perceptions of online learning climate.

Student willingness to talk.

Students reported their perceived willingness to talk or engage in class using Menzel and Carrell's (1999) student willingness to talk scale. Students rated 17 context-modified statements (note: two items that focused specifically on the face-to-face setting were removed) about their willingness to participate in class using a five point Likert-type scale ranging from 0 (never) to 4 (very often). Menzel and Carrell reported an alpha reliability reported for the scale of .92. Alpha reliability for the current study was α = .93 (M = 67.55, SD = 11.44) for student willingness to talk.

Instructor disclosure.

Students reported their perception of instructor self-disclosure using Cayanus and Martin's (2008) instructor disclosure scale. Students rated 14 statements about instructor disclosure using a five point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Five items were reverse coded. Cayanus and Martin reported alpha reliabilities for the scale as follows: a = .77 for amount, a = .80 for relevance, and a = .83 for negativity. Alpha reliabilities for the current study were as follows: a = .75 (M = 14.69, SD = 5.10) for amount, a= .92 (M = 21.99, SD = 7.34) for relevance, and a =. 88 (M = 30.29, SD = 5.98) for negativity.

Student demographics.

Students answered a series of demographic questions inquiring about their sex,

age, major, educational status, and total number of online courses completed.

Data Analysis

A confirmatory factor analysis was employed to test the factorial structure of the OLCS compared to the second phase exploratory factor analysis results. To test hypotheses six and seven, a confirmatory factorial analysis of the OLCS, CCCI, and CCS was employed. Finally, to answer hypotheses eight through thirteen as well as research question four and five, linear and hierarchical regressions were employed.

Results

This section reports the results from phase three of this study. The results are reported under the following headings: Research Question Three, Hypothesis Six and Seven, Hypotheses Eight through Eleven, Research Question Four, Hypotheses Twelve and Thirteen, and Research Questions Five.

Research Question Three: Factorial Structure Replication

In order to answer research question three (i.e., Can the factorial structure of the online learning climate scale (OLCS) be replicated?), another exploratory factorial analysis was conducted to replicate the initial findings from phase two. Three-items from the scale cross-loaded and needed to be removed given the 60/40 guidelines suggested by McCroskey and Young (1979). The items removed were: “Based on my experiences with and perceptions of this online course: The organization of the course was engaging,” “Based on my experiences with and perceptions of this online course: This online course provided ample opportunities for collaboration with the instructor,” and “Based on my experiences with and perceptions of this online course: This online course provided ample opportunities for communication with the instructor.”

The revised unidimensional OLCS comprised of 11-items with an alpha reliability of .96 (M = 66.76, SD = 11.90, Kurtosis = 4.22, Skewness = -1.88) accounted for approximately 74% of the variance with an Eigenvalue of 8.13 (see Table 7).

Table 7: Online Learning Climate Scale with Means, Standard Deviations, and Factor Loadings

Stem – Item	Mean	Std. Deviation	Factor Loading
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As approachable (e.g., someone I would email or visit in virtual office hours).	6.13	1.24	.87
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As encouraging.	6.18	1.19	.92
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As supportive.	6.15	1.28	.91
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR:-In control of the class discussions.	5.53	1.50	.75
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As opened minded.	6.06	1.15	.90
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As sympathetic.	5.79	1.39	.81

Table 7: Online Learning Climate Scale with Means, Standard Deviations, and Factor Loadings (Continued)

BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As engaged in the course.	6.14	1.36	.92
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As engaged with the other students.	6.01	1.37	.87
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As a responsible person.	6.31	1.09	.88
BASED ON MY ONLINE CLASS INTERACTIONS WITH THE INSTRUCTOR, I PERCEIVED MY INSTRUCTOR: -As respectful toward the other students.	6.41	.98	.86
BASED ON MY EXPERIENCES WITH AND PERCEPTIONS OF THIS ONLINE COURSE: - The presence of the instructor was apparent.	6.06	1.36	.77

Extraction Method: Principal Component Analysis.

1 component extracted.

To answer research question three more fully, a confirmatory factor analysis (CFA) was conducted using AMOS 21.0. The following guidelines were used to assess acceptable model fit: (a) when the model chi-square ratio is 2:1 (Byrne, 2001; Kline 2011), (b) the RMSEA statistic does not exceed .1, and (c) the NFI and CFI values are at or above .90 (Hinkin, 1998; Kline, 2011). Given these guidelines, the 11-item OLCS approached acceptable model fit: X^2 (44) = 264.76, p = .000, RMSEA = .20, NFI= .85, CFI = .87. Finally, the fit of the model could not be improved through item reduction.

Hypotheses Six and Seven: Scale Distinctiveness

In order to establish discriminant validity of the scale, hypotheses six and seven posited that the OLCS would be distinct from two traditional classroom climate scales (CCCI and CCS). More specifically, hypothesis six [H6] suggested that the factorial loadings between the online learning climate scale (OLCS) and the class climate scale (CCS) would not be isomorphic and the factors would load separately onto different factors. Hypothesis seven [H7] suggested the factorial loadings between the online learning climate scale (OLCS) and classroom connectedness climate inventory (CCCI) would not be isomorphic and the factors would load separately onto different factors. To determine that the scales are indeed different, a confirmatory factorial analysis was conducted (see Table 8).

Table 8: Fit of One Factor and Two Factors for Three Climate Scales

Model	Fit Statistics				
	χ^2	*Df*	*CFI*	*NFI*	*RMSEA*
OLCS	264.76	44	.87	.85	.20
OLCS & CCCI-One factor	1448.89	252	.61	.57	.19
OLCS & CCCI-Two factor	824.23	251	.82	.76	.13
OLCS & CCS-One Factor	862.65	189	.74	.70	.16
OLCS & CCS-Two Factor	608.41	188	.84	.79	.13

In sum, the OLCS demonstrated discriminant validity from each of the unidimensional traditional climate scales (CCCI and CCS). The best fit occurred when the scales were not forced onto the same factor: CCS, X^2 (188) = 608.41, p = .000, RMSEA = .13, NFI= .79, and CFI = .84, and CCCI, X^2 (251) = 824.23, p = .000, RMSEA = .13, NFI= .76, CFI = .82.

Hypotheses Eight thru Eleven: Learner Empowerment

To address the predictive hypotheses regarding the validity of the IBM variables in an online context, a linear regression was employed. Hypothesis eight [H8] stated that students' perceptions of classroom procedural justice would predict learner empowerment. For H8, a linear regression was used with classroom procedural justice entered as the predictor and learner empowerment as the outcome variable. Results were significant, F (1, 119) = 135.82, p = .000, R^2 = .53, with classroom procedural justice being a significant positive predictor (β = .73, t = 11.65, p = .000) of learner empowerment. This hypothesis was supported (see Table 9).

Hypothesis nine [H9] stated that instructor disclosure would predict learner empowerment. For H9, a linear regression was used with each of the three factors for instructor disclosure entered as the predictor and learner empowerment as the outcome variable. Results were significant, F (3, 121) = 8.19, p = .000, R^2 = .15, with instructor disclosure negativity not being a significant predictor (β = .17, t = 1.84, p = .07), but instructor disclosure amount being a significant predictor (β = .23, t = 2.10, p = .04), and instructor disclosure relevance being a significant predictor (β = .25, t = 2.40, p = .02) of learner empowerment. This hypothesis was partially supported (see Table 9).

Hypothesis ten [H10] stated that student willingness to talk in class would predict learner empowerment. For H10, a linear regression was used with student willingness to talk entered as the predictor and learner empowerment as the outcome variable. Results were significant, F (1, 123) = 84.30, p = .000, R^2 = .40, with student willingness to talk being a significant predictor (β = .64, t = 9.18, p = .01) of learner empowerment. This hypothesis was supported (see Table 9).

Finally, hypothesis eleven [H11a] and b [H11b] stated that learner empowerment would predict student affective and cognitive learning. For H11a, a linear regression was used with learner empowerment entered as the predictor and all three types of affective learning (i.e., instructor, course, and content) entered individually as the outcome variable. Results were significant, F (1, 123) = 41.92, p = .000, R^2 = .25, with learner empowerment as a predictor (β = .50, t = 6.48, p = .000) of instructor affect. Results were also significant, F (1, 123) = 52.92, p = .000, R^2 = .30, with learner empowerment as a predictor (β = .55, t = 7.27, p = .000) of course affect. Results were also significant, F (1, 123) = 98.85, p = .000, R^2 = .45, with learner empowerment as a predictor (β = .67, t = 9.94, p = .000) of content affect. Overall, all parts of this hypothesis were supported (see Table 9).

For H11b, a linear regression was used with learner empowerment entered as the predictor and cognitive learning as the outcome variable. Results were significant, F (1, 119) = 32.70, p = .000, R^2 = .21, with learner empowerment as a predictor (β = .46, t = 5.70, p = .000) of cognitive learning. This hypothesis supported (see Table 9).

Table 9: Summary of Linear Regression (H8, H9, H10, H11a and H11b)

Variable	*B*	*SE B*	β
Classroom Procedural Justice = LE	.69	.06	.73**
Instructor Disclosure: Amount = LE	.52	.25	.23*
Instructor Disclosure: Relevance = LE	.38	.16	.25*
Instructor Disclosure: Negativity = LE	.32	.17	.17
Student's Willingness to Talk = LE	.62	.07	.64**
LE = Affective Learning: Instructor	.19	.03	.50**
LE = Affective Learning: Course	.32	.04	.55**
LE = Affective Learning: Content	.27	.03	.67**
LE = Cognitive Learning	.27	.05	.46**

Note. *$p < .05$, **$p < .01$
Learner Empowerment = LE

Research Question Four: An Alternative (a.k.a. Modified) Model for Online Learning Climate

A hierarchical regression was employed to answer research question four regarding the inclusion of additional variables and online context within the IBM. The first regression model included instructor disclosure, classroom procedural justice, and student willingness to talk as predictors of affect and cognitive learning. The second regression model included instructor disclosure, classroom procedural justice, and student willingness to talk predicting learner empowerment, which mediated the each learning outcome (i.e., instructor affect, course affect, content affect, and cognitive learning).

Instructor affect. These results were significant, F (5, 112) = 21.76, p = .000, R^2 = .49. The first regression model accounted for 49% of the variance. Next, a second model was tested using hierarchical regression. The model included instructor disclosure, classroom procedural justice, and student willingness to talk were entered in the first block as first-order constructs with learner empowerment entered in the second block as the mediator for instructor affect as the outcome variable. Results were significant, F (6,

111) = 18.10, p = .000, R^2 = .49 (instructor). The second regression model (i.e., with learner empowerment as the mediator) did not improve the variance even with the addition of learner empowerment. In the second model, classroom procedural justice (β = .46, t = 4.24, p = .000), instructor disclosure negativity (β = .17, t = 2.13, p = .04), and student willingness to talk (β = .27, t = 2.09, p = .000) were the only significant individual predictors for instructor affect. Learner empowerment (β = -.07, t = -.62, p = .54), instructor disclosure amount (β = .01, t = .14, p = .88), and relevance (β = .12, t = 1.38, p = .17) were not significant predictors of instructor affect (see Table 10). The change between the first and second model was not significant and accounted for less than .2% change in variance. Thus, the alternative model partially replicated the original IBM.

Table 10: Instructor Affect Hierarchal Regression (RQ4)

	Model 1			*Model 2*		
Variable	*B*	*SE B*	B	*B*	*SE B*	β
Student Willingness to Talk	.09	.03	.24**	.10	.03	.27**
Classroom Procedural Justice	.14	.03	.42**	.16	.04	.46**
Instructor Disclosure: Amount	.01	.08	.01	.01	.08	.01
Instructor Disclosure: Relevance	.07	.05	.12	.07	.05	.12
Instructor Disclosure: Negativity	.13	.06	.18*	.12	.06	.17*
Learner Empowerment				-.26	.04	-.07
R^2		.49**			.49	
F change		21.76**			.378	

Note. *p < .05, **p < .01

Course affect. Results were significant, F (5, 112) = 13.66, p = .000, R^2 = .38. The first regression model accounted for 38% of the variance. Next, a second model was tested using hierarchical regression. The model included instructor disclosure, classroom procedural justice, and student willingness to talk entered in the first block as first-order

constructs with learner empowerment entered in the second block as the mediator for course affect the outcome variable. Results were significant, F (6, 111) = 11.96, p = .000, R^2 = .39 (course). The second model improved the variance by 1%. In the mediating model, classroom procedural justice (β = .28, t = 2.32, p = .02) was the only significant individual predictor for course affect. Learner empowerment (β = .21, t = 1.59, p = .12), instructor disclosure amount (β = .01, t = .12, p = .91), relevance (β = .18, t = 1.83, p = .07), negativity (β = .03, t = .32, p = .75), and student willingness to talk (β = .11, t = 1.07, p = .29) were not significant predictors of course affect (see Table 11). Thus, the alternative model only partially replicated the original IBM.

Table 11: Course Affect Hierarchal Regression (RQ4)

	Model 1			*Model 2*		
Variable	*B*	*SE B*	β	*B*	*SE B*	β
Student Willingness to Talk	.11	.05	.19*	.06	.06	.11
Classroom Procedural Justice	.21	.05	.39**	.15	.06	.28*
Instructor Disclosure: Amount	.02	.13	.01	.02	.13	.01
Instructor Disclosure: Relevance	.17	.08	.18	.16	.09	.18
Instructor Disclosure: Negativity	.01	.10	.01	.03	.10	.30
Learner Empowerment				.12	.07	.21
R^2		.38**			.39	
F change		13.66**			2.53	

Note. *p < .05, **p < .01

Content affect. Results were significant, F (5, 112) = 21.72, p = .000, R^2 = .49. The first regression model accounted for 49% of the variance. Next, a second regression model was tested using hierarchical regression. The model included instructor disclosure, classroom procedural justice, and student willingness to talk entered in the first block as first-order constructs with learner empowerment entered in the second block as the mediator for content affect as the outcome variable. Results were significant, F (6, 111) =

22.76, $p = .000$, $R^2 = .55$ (content). The second model accounted for 55% of the variance, which did improve with the addition of learner empowerment by 6%. In the mediating model, classroom procedural justice (β = .25, $t = 2.48$, $p = .02$), instructor disclosure negativity (β = .18, $t = 2.37$, $p = .02$), and learner empowerment (β = .42, $t = 3.83$, $p = .000$) were the only significant individual predictors for content affect. Student willingness to talk (β = .03, $t = .31$, $p = .76$), instructor disclosure amount (β = .02, $t = .26$, $p = .80$), and relevance (β = .07, $t = .85$, $p = .40$) were not significant predictors of content affect (see Table 12). Thus, the alternative model replicated the original IBM.

Table 12: Content Affect Hierarchal Regression (RQ4)

	Model 1			Model 2		
Variable	*B*	*SE B*	β	*B*	*SE B*	β
Student Willingness to Talk	.07	.03	.19*	.01	.03	.03
Classroom Procedural Justice	.18	.03	.49**	.09	.04	.25*
Instructor Disclosure: Amount	.02	.08	.03	.02	.08	.03
Instructor Disclosure: Relevance	.05	.05	.08	.04	.05	.07
Instructor Disclosure: Negativity	.10	.06	.14	.14	.06	.18*
Learner Empowerment				.17	.04	.42**
R^2		.49**			.55**	
F change		21.72**			14.67**	

Note. *$p < .05$, **$p < .01$

Cognitive learning. Results were significant, F (5, 109) = 16.70, $p = .000$, $R^2 = .43$. The first regression model accounted for 43% of the variance. Next, a hierarchical regression was used with instructor disclosure, classroom procedural justice, and student willingness to talk entered in the first block as first-order constructs and learner empowerment entered in the second block as the mediator for cognitive learning as the outcome variable. The results were significant, F (6, 108) = 14.65, $p = .000$, $R^2 = .45$. This model accounted for 45% of the variance. The second model with cognitive learning

as the outcome variable and learner empowerment as the mediator improved an additional 2% of the variance when accounting for the mediator, learner empowerment. In the mediating model, classroom procedural justice (β = .30, *t* = 1.71, *p* = .01), instructor disclosure negativity (β = .39, *t* = 4.61, *p* = .000), and relevance (β = .18, *t* = 2.01, *p* = .05) were the only significant individual predictors for cognitive learning. Instructor disclosure amount (β = .06, *t* = .57, *p* = .57), learner empowerment (β = .21, *t* = 1.71, *p* = .09), and student's willingness to talk (β = -.14, *t* = -1.42, *p* = .16) were not significant predictors of cognitive learning (see Table 13). Thus, the alternative model partially replicated the original IBM.

Table 13: Cognitive Learning Hierarchal Regression (RQ4)

	Model 1			Model 2		
Variable	*B*	*SE B*	β	*B*	*SE B*	β
Student Willingness to Talk	-.31	.05	-.06	-.08	.05	-.14
Classroom Procedural Justice	.22	.05	.41**	.16	.06	.30**
Instructor Disclosure: Amount	.08	.13	.06	.07	.13	.06
Instructor Disclosure: Relevance	.17	.08	.19*	.16	.08	.18*
Instructor Disclosure: Negativity	.41	.09	.37**	.43	.09	.39**
Learner Empowerment				.12	.07	.21
R^2		.43**			.45	
F change		16.70**			2.91	

Note. *$p < .05$, **$p < .01$

Hypotheses Twelve and Thirteen: Behavioral Intentions

To address the predictive hypotheses regarding additional construct variables in an online context, linear and hierarchal regressions were employed. Hypothesis twelve [H12] stated that student perceptions of learner empowerment would positively predict student behavioral intentions. A linear regression was used with learner empowerment as the predictor and behavioral intentions entered as the outcome variable. Results were

significant, F (1, 122) = 55.11, p = .000, R^2 = .31, with learner empowerment as a predictor (β = .56, t = 7.42, p = .000) of behavioral intentions. This hypothesis was supported.

Hypothesis thirteen [H13a] and [H13b] posited that student reports of behavioral intentions would positively predict their perceptions of affective learning and cognitive learning. For H13a, a linear regression was used with behavioral intentions as the predictor and affective learning entered as the outcome variable. The results were significant, F (1, 125) = 51.64, p = .000, R^2 = .29, with behavioral intentions as a predictor (β = .54, t = 7.9, p = .000) of instructor affect. The results were also significant, F (1, 125) = 48.37, p = .000, R^2 = .27, with behavioral intentions as a predictor (β = .53, t = 6.96, p = .000) of course affect. Results were significant, F (1, 125) = 79.86, p = .000, R^2 = .39, with behavioral intentions as a predictor (β = .62, t = 8.84, p = .000) of content affect. Overall, all parts of this hypothesis were supported (see Table 14).

To address H13b, a linear regression was used with behavioral intentions entered as the predictor and cognitive learning as the outcome variable. Results were significant, F (1, 120) = 28.21, p = .000, R^2 = .18, with behavioral intentions as a predictor (β = .44, t = 5.31, p = .000) for cognitive learning. This hypothesis was supported (see Table 14).

Table 14: Summary of Linear Regression (H12, H13a, and H13b)

Variable	*B*	*SE B*	β
Learner Empowerment = BI	.25	.03	.56
BI = Affective Learning (Instructor)	.46	.06	.54
BI = Affective Learning (Content)	.56	.06	.62
BI = Affective Learning (Course)	.69	.10	.53
BI = Cognitive Learning	.57	.11	.44

Note. All results were significant at the *p = .000*
Behavioral Intentions = BI

Research Question Five: Inclusion of Climate in the Alternative Model

Research question five considered whether student perceptions of climate in the online classroom would extend the overall IBM model. To answer this question, a hierarchal regression was employed. The first model included instructor disclosure, classroom procedural justice, and student willingness to talk as first-order constructs and climate as a second-order construct predicting learner empowerment as a third order construct, which mediates the fourth-order construct, affective learning. A second model included instructor disclosure, classroom procedural justice, and student willingness to talk as first-order constructs and climate as a second-order construct mediating the outcome variable, cognitive learning. A third model included instructor disclosure, classroom procedural justice, and student willingness to talk as first-order constructs and climate as a second-order construct predicting learner empowerment, the third order construct, which mediates the fourth-order construct, cognitive learning.

Instructor affect. Results from this first model (i.e., only including block one and the outcome variable) were significant, F (5, 115) = 22.33, p = .000, R^2 = .51. The first regression model accounted for 51% of the variance. Next, a second model (i.e., including block one, block two, and the outcome variable) was tested using hierarchical regression. The model included instructor disclosure, classroom procedural justice, and student willingness to talk entered in the first block as first-order constructs with climate entered in the second block as the mediator for the outcome variable, instructor affect. The results were significant, F (6, 108) = 31.21, p = .000, R^2 = .63 (instructor). The third model (i.e., including block one, block two, block three, and the outcome variable) included instructor disclosure, classroom procedural justice, and student willingness to

talk entered in the first block as first-order constructs with climate entered in the second block as the second order construct, learner empowerment entered in the third block as the mediator for the outcome variable, instructor affect. Results were significant, F (7, 107) = 27.33, p = .000, R^2 = .64 (instructor). The second model significantly improved the variance by 13% with the addition of climate, while the third model only improved the variance by 1% with the addition of learner empowerment. In the third model, classroom procedural justice (β = .30, t = 3.12, p = .002), instructor disclosure negativity (β = .15, t = 2.09, p = .04), student willingness to talk (β = .25, t = 3.13, p = .002), and climate (β = .45, t = 6.34, p = .000) were the only significant individual predictors for instructor affect. Learner empowerment (β = -.15, t = -1.45, p = .15), instructor disclosure amount (β = .02, t = .22, p = .83), and relevance (β = .11, t = 1.38, p = .17) were not significant predictors of instructor affect (see Table 15). Thus, the addition of the climate variable in the alternative model did enhance the predictive model.

Table 15: Instructor Affect Hierarchal Regression (RQ5)

	Model 1			Model 2			Model 3		
Variable	*B*	*SE B*	B	*B*	*SE B*	β	*B*	*SE B*	β
Student Willingness to Talk	.09	.03	.25**	.07	.03	.19**	.09	.03	.25**
Classroom Procedural Justice	.14	.03	.42**	.08	.03	.22**	.10	.03	.30**
Instructor Disclosure: Amount	.00	.08	.00	.01	.07	.02	.02	.07	.02
Instructor Disclosure: Relevance	.07	.05	.13	.06	.04	.10	.06	.04	.11
Instructor Disclosure: Negativity	.13	.06	.18*	.12	.05	.16*	.10	.05	.15*
Climate				1.73	.28	.44**	1.80	.38	.45**
Learner Empowerment							-.06	.04	-.15
R^2		.51**			.13**				.01
F change		22.33**			33.85**				2.11

Note. *p < .05, **p < .01

Course Affect. Results from this first model (i.e., only including block one and the outcome variable) were significant, F (5, 109) = 13.37, p = .000, R^2 = .38. The first

regression model accounted for 38% of the variance. Next, a second model (i.e., including block one, block two, and the outcome variable) was tested using hierarchical regression. The model included instructor disclosure, classroom procedural justice, and student willingness to talk in the first block as first-order constructs with climate entered in the second block as the mediator for the outcome variable, course affect. The results were significant, F (6, 108) = 12.22, p = .000, R^2 = .40. The second model accounted for 40% of the variance, which was significantly improved by 2%. The third model (i.e., including block one, block two, block three, and the outcome variable) included instructor disclosure, classroom procedural justice, and student willingness to talk entered in the first block as first-order constructs with climate entered in the second block, and learner empowerment entered in the third block as the mediator for the outcome variable, course affect. Results were significant, F (7, 107) = 10.83, p = .000, R^2 = .42. The third model accounted for 42% of the variance and improved the overall variance by 5% with the addition of learner empowerment. In the third model, none of the predictors were significant for course affect: climate (β = .17, t = 1.86, p = .07, classroom procedural justice (β = .21, t = 1.71, p = .09), student willingness to talk (β = .10, t = 1.04, p = .30), learner empowerment (β = .18, t = 1.37, p = .18), instructor disclosure amount (β = .02, t = .18, p = .86), negativity (β = .02, t = .21, p = .83), and relevance (β = .17, t = 1.72, p = .09) (see Table 16). Thus, the addition of the climate variable within the alternative model did enhance the predictive model.

Table 16: Course Affect Hierarchal Regression (RQ5)

	Model 1			Model 2			Model 3		
Variable	*B*	*SE B*	B	*B*	*SE B*	β	*B*	*SE B*	β
Student Willingness to Talk	.12	.05	.20*	.10	.05	.17	.06	.06	.10
Classroom Procedural Justice	.21	.05	.39**	.16	.06	.30**	.11	.07	.21
Instructor Disclosure: Amount	.02	.14	.01	.03	.14	.02	.02	.14	.02
Instructor Disclosure: Relevance	.17	.09	.19	.16	.09	.17	.15	.09	.17
Instructor Disclosure: Negativity	.00	.10	.00	-.01	.10	-.01	.02	.10	.02
Climate				1.19	.57	.19*	1.07	.57	.17
Learner Empowerment							.11	.08	.18
R^2		.38**			.02*			.01	
F change		13.37**			4.42*			1.87	

Note. *$p < .05$, **$p < .01$

Content affect. Results from this analysis (i.e., only including block one and the outcome variable) were significant, F (5, 109) = 20.74, p = .000, $R^2 = .49$. The first regression model accounted for 49% of the variance. Next, a second model (i.e., including block one, block two, and the outcome variable) was tested using hierarchical regression. The model included instructor disclosure, classroom procedural justice, and student willingness to talk entered in the first block as first-order constructs with climate entered in the second block as a second-order construct, and learner empowerment entered in the third block as the mediator for the outcome variable, content affect. The results were significant, F (6, 108) = 19.48, $p = .000$, $R^2 = .52$. The second model accounted for 52% of the variance with a significant increase of 3%. A third model (i.e., including block one, block two, block three, and the outcome variable) was tested using hierarchical regression. The model included instructor disclosure, classroom procedural justice, and student willingness to talk entered in the first block as first-order constructs with climate entered in the second block as a second-order construct, and learner

empowerment entered in the third block as the mediator for the outcome variable, content affect. The results were significant, F (7, 107) = 19.23, p = .000, R^2 = .56 (instructor). The third model variance of 56% improved the model overall by 7% with the addition of climate and learner empowerment. In the third model, classroom procedural justice (β = .22, t = 2.03, p = .05), climate (β = .18, t = 2.26, p = .03), and learner empowerment (β = .34, t = 3.00, p = .003) were the only significant individual predictors for content affect. Instructor disclosure amount (β = .03, t = .29, p = .78), relevance (β = .07, t = .84, p = .40), negativity (β = .14, t = 1.80, p = .08), and student willingness to talk (β = .05, t = .56, p = .58) were not significant predictors of instructor affect (see Table 17). Thus, the addition of the climate variable within the alternative model did enhance the predictive model.

Table 17: Content Affect Hierarchal Regression (RQ5)

	Model 1			Model 2			Model 3		
Variable	*B*	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	B
Student Willingness to Talk	.08	.03	.21*	.07	.03	.18	.02	.03	.05
Classroom Procedural Justice	.17	.03	.49**	.14	.03	.39*	.08	.04	.22*
Instructor Disclosure: Amount	.02	.08	.03	.02	.08	.03**	.02	.08	.03
Instructor Disclosure: Relevance	.06	.05	.10	.05	.05	.83	.04	.05	.07
Instructor Disclosure: Negativity	.08	.06	.10	.07	.06	.09	.10	.06	.14
Climate				.90	.33	.22**	.74	.33	.18*
Learner Empowerment							.13	.04	.34**
R^2		.49**			.03**			.04**	
F change		20.74**			7.25**			9.02**	

Note. *p < .05, **p < .01

Cognitive Learning. Results from this analysis (i.e., only including block one and the outcome variable) were significant, F (5, 106) = 15.51, p = .000, R^2 = .42. The first regression model accounted for 42% of the variance. Next, a second model (i.e.,

including block one, block two, and the outcome variable) was tested using hierarchical regression. This model used instructor disclosure, classroom procedural justice, and student willingness to talk entered in the first block as first-order constructs and climate entered in the second block as the mediator for the outcome variable, cognitive learning. The results were significant, F (6, 105) = 18.10, p = .000, R^2 = 51. This model accounted for 51% of the variance, which was a significant addition of 9%. Lastly, a third model (i.e., including block one, block two, block three, and the outcome variable) was tested. This model used instructor disclosure, classroom procedural justice, and student willingness to talk entered in the first block as first-order constructs with climate entered in the second block, and learner empowerment entered in the third block as the mediator for the outcome variable, cognitive learning. The results were significant, F (7, 104) = 15.76, p = .000, R^2 = 52. This model accounted for 52% of the variance with only a 1% increase from the second model. Overall, the third model with cognitive learning as the outcome variable and climate included as another predictor with learner empowerment as the mediator improved an additional 10% of the variance when accounting for the mediator, learner empowerment and the addition of climate. In the mediating model, instructor disclosure negativity (β = .37, t = 4.61, p = .000) and climate (β = .34, t = 4.05, p = .000) were the only significant individual predictors for cognitive learning. Instructor disclosure amount (β = .07, t = .70, p = .49) and relevance (β = .16, t = 1.85, p = .07), along with classroom procedural justice (β = .19, t = 1.71, p = .09), learner empowerment (β = .14, t = 1.15, p = .25), and student willingness to talk (β = -.16, t = -1.76, p = .81) were not significant predictors of cognitive learning (see Table 18). Thus, the addition of the climate variable within the alternative model did enhance the predictive model.

Table 18: Cognitive Learning Hierarchal Regression (RQ5)

	Model 1			Model 2			Model 3		
Variable	*B*	*SE B*	B	*B*	*SE B*	B	*B*	*SE B*	β
Student Willingness to Talk	-.03	.05	-.06	-.06	.05	-.11	-.09	.05	-.16
Classroom Procedural Justice	.22	.05	.41**	.14	.05	.25**	.10	.06	.19
Instructor Disclosure: Amount	.07	.13	.05	.09	.12	.07	.90	.12	.07
Instructor Disclosure: Relevance	.17	.08	.20*	.15	.08	.17	.14	.08	.16
Instructor Disclosure: Negativity	.41	.10	.36**	.40	.90	.35**	.42	.09	.37**
Climate				2.19	.51	.35**	2.09	.52	.34**
Learner Empowerment							.08	.07	.14
R^2		.42**			.09**			.01	
F change		15.51**			18.36**			1.33	

Note. *$p < .05$, **$p < .01$

Summary

Phase three of this study served to confirm the factorial structure of the scale, establish discriminant validity, test the IBM theoretical framework with different variables, and test the OLCS as an extension of the model. Phase three produced several key results. First, the 11-item, parsimonious OLCS was validated as distinct from the other classroom climate scales. Second, the factorial structure of the scale was refined and approached structural confirmation. Third, testing of the IBM scale within the online context helped to explain which instructor, student, and course variables impact learner empowerment and learning outcomes. Further testing incorporating the variable behavioral intent as another construct to the model revealed significant and meaningful change to the model. Lastly, including climate revealed that learner empowerment (i.e., the instructional belief mediator) was not a significant predictor for any of the learning outcomes.

CHAPTER SIX: DISCUSSION

Colleges and universities across the United States are transitioning courses to be delivered in online formats (Konetes, 2011). Consequently, research that informs pedagogical best practices in course design and implementation is warranted. More specifically, research regarding the role of communication in online instruction must be conducted to ensure the instructional communication integrity of those variables employed. This dissertation research project contributes to that call by focusing specifically on classroom climate in online settings. The Online Learning Climate Scale (OLCS) was developed and tested as a means of informing instructional communication best practices in online classrooms. This chapter offers conclusions and implications based on the results of this three-phase study, as well as limitations and suggestions for future research.

Conclusions

Several conclusions are drawn from this analysis. These conclusion are arranged according to the research questions and hypotheses addressed in each of the three phases.

Phase One Conclusions.

The first phase of this dissertation sought to better understand perceptions of classroom climate in online courses. Based on the focus group conversation analyses, two conclusions can be drawn. First, the online students confirmed much of what Dwyer and colleagues (2004) claim about student connectedness. Students reported that most, if not all, of the items were comprehensive to what they believe construct climate in their online courses. Second, after reviewing the proposed scale items in focus groups with online course designers and instructors, much of what was discussed extended the items

including organizational climate theory (James & Jones, 1974) as well as Gokcora's (1989) and Dwyer et al.'s (2004) theoretical perspectives on climate.

Thus, a comprehensive list of items was created to measure students' perspectives of online learning climate. These items are representative of student perceptions of the online instructor, students, and course. Thus, conclusions from phase one confirm several elements of classroom climate proposed in existing literature about traditional face-to-face classrooms and extend them to also explain perceptions about instructor, students, and course in an online context.

Phase Two Conclusions.

The second phase of this dissertation project sought to validate a newly created scale. A unidimensional parsimonious scale (OLCS) purports to examine climate in online classrooms. Analysis of the 14-item OLCS yielded a highly reliable with an alpha of .95. Moreover, the scale's convergent and concurrent validity were confirmed using validated classroom climate and learning outcome measures. The results from the two types of validity analysis explain that the OLCS is a scale that performs as theoretically expected and is capturing what it purports. Based on these findings, one can conclude that the OLCS is a valid and reliable instrument for measuring online classroom climate. Thus, the OLCS contributes to existing literature and scales on classroom climate (Cooper, 1995, Dwyer et al., 2004, Gokcora, 1989, Moos & Trickett, 1987) by proposing a reliable tool for measuring climate in the online classroom environment.

Phase Three Conclusions.

The third phase of this dissertation was based on the refinement and validation of the OLCS, as well as model testing for predictive validity. Several key conclusions may

be drawn from the phase three analyses.

First, results from the exploratory factorial analysis suggested that the OLCS items be refined from fourteen to eleven. The refined OLCS produced a higher alpha of .96 and an approaching model fit. The OLCS also correlated as anticipated to learning outcomes, but was a distinct and unique measure from other classroom climate scales (CCCI and CCS).

The testing of three alternative models using IBM as the theoretical framework provided several key conclusions about the models and online learning. First, the expansion of student characteristics to also include student behaviors to predict an instructional belief was justified in the alternative variables for online learning model. Second, and contrary to face-to-face classrooms, perceived learner empowerment as an instructional belief for online students was not a significant predictor of learning outcomes in most cases. Third, and new to IBM, behavioral intentions significantly predicted affective and cognitive learning in the online classroom. Finally, the inclusion of online climate as a second-order construct within the alternative model suggests that climate plays a vital role in online learning. Given this last finding, climate seems to be an important factor in the online classroom. Consequently, future implementation of online courses ought to consider how to construct climate within those classes.

Implications

The conclusions drawn from this project point to several implications for online course designers and instructors, program administrators, and students. The guidelines presented below support and reflect the findings from aforementioned traditional classroom climate work, as well as findings from this dissertation. According to Sprague

(1992), “the view of instructors’ work reflected in most of our research on instructional communication suggests that instructors make educational decisions about what is to be taught, how it is to be taught, and how to evaluate whether or not it has been taught” (p. 7). This statement rings true for online course creation, dissemination, and support, as well.

Nevertheless, traditional and online courses are markedly different. In fact, unlike traditional face-to-face classrooms, results of this study suggest that instructor behaviors are the most important predictor of students’ perception of a positive classroom climate in online courses. Thus, online instructors simply cannot take a traditional course and put it online. Course design and implementation must be based on discussion based on research before the course starts to ensure a successful experience (Ko & Rossen, 2010). Online instructors also need to be cognizant of their role in establishing course climate. Given the relationship between climate and learning outcomes, what follows are some suggestions for online course designers and instructors to consider when developing their courses.

Suggestions for Online Course Designers and Instructors

1. The instructor presence in the course that he or she is teaching is vital. Recorded lectures, responses, and any mediated interactions must be the instructor for the course. The instructor needs to be strategic about modeling assignments and using his or her own personal examples/explanations to exemplify the content or tasks.
2. Multiple forms of communication should be offered between the student and instructor. Having multiple forms will present the opportunity for the instructor to be perceived as approachable. Email should not be the only line of

communication. For example, course designers and instructors need to provide virtual office link, which can be supported through a web conferencing software and provide feedback tools for assignments and discussions.

3. Instructors need to provide constructive feedback. Feedback should be timely and personalized for the student. The instructors need to consider their responsibilities to the course and be transparent about what those responsibilities are with the students. This can be stated explicitly on the course syllabus.
4. Online instructors need to intentionally and transparently "check-in" on students. They should praise a student for doing well and point out concerns when he or she is not performing up to expectations. This will demonstrate support, empathy, and engagement; all of which promote a positive classroom climate. Hence, instructors need to keep in mind that simply responding to emails and posting videos does not solely count as being engaged with students.
5. There needs to be transparent and clear guidelines and expectations for the online course. This can be accomplished in several ways. First, designers should construct the course in ways that ensuring students will have easy access and ability to function in the LMS. Second, the nature of the syllabus needs to be specific and redundant. This will provide students will all the information they need regarding those expectations and guidelines. Lastly, there needs to be other forms of guidelines presented. This can be accomplished through grading rubrics, assignment sheet details, posting a short video where the instructor explains a concept, assignment, etc., or by posting other students' questions anonymously in

an email or posting with the instructor's response so students can feel a part of the conversation.

1. Suggestions for Program Administrators Course builders and instructors for online courses also need time to plan, design, and implement materials for an online course. In doing so, the two can be strategic and purposeful regarding how to construct climate strategies within the online course.
2. Training for course designers and instructors is vital. Technology is constantly evolving and how we communicate and engage online does as well.
3. Technical support and continuous professional development are also encouraged for course designers and instructors. Incorporating professional developments that will support instructional communication as well as technology communication education is key for providing the best possible tools and resources to all involved.

Suggestions for Students

1. Similar to a traditional course, online students need to make attempts to interact with their instructor. Because there is no actual face-to-face time, however, students must make concerted efforts to do so. The student requesting virtual meetings, sending emails to the instructor, and providing information about him or herself can accomplish instructor-student interaction.
2. Students should collaborate and communicate with each other whether it be asynchronously or synchronously.
3. Online students need to inform themselves with the course policies (i.e., read the syllabus and ask questions).

In sum, online course designers and instructors need to be cognizant of the communication strategies for establishing climate in their courses. Because course specific structural issues play such a key role in creating climate in online courses, the designer/instructor plays a vital role in climate construction. Much of what was found from the three phases contrasts with the findings of Dwyer and colleagues (2004). They claim that students' connectedness fosters the climate creation in face-to-face/traditional courses. Interestingly, based on findings from this dissertation, students are even more concerned with their interactions with the instructor than in traditional face-to-face courses. Moreover, students still need to interact with one another for engagement, learning, and socialization purposes (Manstead, Lea, & Goh, 2011; Walther, 2011). Nevertheless, instructors hold the power for how climate is perceived by students. This is a huge responsibility for online instructors and should not be dismissed.

Due to the role of responsibility for the instructor and the potential for positive or detrimental learning outcomes, professional development training for faculty planning to teach online courses is critical. These trainings should focus on how to establish and maintain a positive classroom climate via course design and instructor behaviors such as using supportive communication, establishing presence, being approachable online, and creating engagement opportunities. Moreover, they also need to learn to employ strategies to encourage interaction and engagement among students via course specific structural techniques and Web conferencing software.

Limitations

Several limitations must be noted regarding this study. One limitation concerns the diversity in the phase one and two sample. While attempts were made to capture both

undergraduate and graduate student responses, this was not achieved. Second, participants were asked to complete the survey online versus reporting to a controlled setting like a lab. While this may keep with the authenticity of online, there is less control regarding whether the participants take the survey seriously. Third, the small sample amount of individuals collected during the third phase could possibly contribute to the fit issues seen within the confirmatory factor analysis. Given the relatively low sample size, one could argue that there was not enough power to compute the complete factorial structure of the OLCS. Morrison (2009) and Noar (2003) suggest 150 to 250 responses for sample size to obtain enough power to confirm the scale. This could be one explanation for the approaching acceptability results for model fit.

Recommendations

The conclusions, implications, and limitations of this dissertation give rise to several recommendations for future research. First, testing the OLCS in different educational contexts would not only confirm the validity of the scale, it would also provide useful information regarding climate construction within those different educational contexts (e.g., for-profit, community college, technical college). Thus, exploring the different types of institutions will also provide information regarding the students' perspectives for climate within those different contexts. Other suggestions regarding future investigation of climate within the online classroom would be to examine the perceptions of undergraduate versus graduate students, the perceptions of international online students compared to students in the United States, and explore climate within a MOOC. Exploring these suggestions may provide a clearer picture regarding climate construction and the role of the instructor.

Next, further testing of the IBM with the OLCS construct could yield fruitful results. Conclusions of this study suggest that more is happening in the online classroom regarding the linkages between first-order constructs, climate, and the different types of learning outcomes. The last suggestion concerns testing of OLCS longitudinally. It is suspected that investigating how perception of climate changes over the semester or several semesters of courses in a sequence may impact one or more of the learning outcomes.

Summary

Based on this dissertation, continuing to examine the instructional communication strategies employed in the online classroom will not only help online course designers, instructors, and program administrators, but may also help improve the future students' online learning experience.

The role of the instructor is not only important, but critical to the construction of a positive classroom climate in online settings. This discovery runs counter to the assumptions often made about the instructor's role in online learning. Climate in the online classroom is constructed when the instructor demonstrates social presence, availability, support, and empathy. To be effective, online instructors must employ strategies to engage and interact positively with students. As in traditional face-to-face classrooms, this study confirms that student learning is influenced by climate of online courses. Course designers and instructors need to be cognizant of their role in constructing climate. Online course delivery in higher education is here to stay. To ensure educational integrity, instructional communication researchers must play a central role in informing the role of communication in course design and implementation. More

specifically, course designers and instructors must employ instructional communication strategies that promote a positive classroom climate if they are to ensure effective affective, cognitive, and behavioral learning in online settings.

APPENDIX

Appendix A: Phase 1 (A & B): Focus Group Interview Script

Welcome! I am conducting research on students' perceptions of climate in an online learning class. One issue with studying this phenomenon is that there is little agreement about what online learning climate means or looks like. As a result, I invited you here today to talk to me about online learning climate.

1. What does online learning climate mean to you?
2. How does it differ from traditional classroom climate?
3. What does online learning climate look like?
4. What are some specific ways to build climate in an online class?
5. How does climate impact the online classroom, if at all?

After reviewing the literature on climate and online learning, I have generated a list of perceptions that show online learning climate. I want to show you this list and find out your reactions to the list.

1. What do you think about the list?
2. Which perceptions fit with your idea of online learning climate? Why?
3. Which perceptions don't fit with your idea of online learning climate? Why?
4. What is most surprising about the list, if anything?
5. What is missing from the list, if anything?

Demographic Form

Sex: Male Female **Age:** _____

Focus Group Type:

I am a college student: (circle one)

First year
Sophomore
Junior
Senior
Graduate Student

I have taken _____ (amount) online classes while attending this university.

I am a faculty member: (circle one)

Lecturer
Tenure Track
Tenured
Staff
Other_____

I have taught _____ (amount) online classes at this university.

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